

Oct. 30, 1995

News**NEWS****4 IBM PC Co. reorganization**

IBM PC Co. tries some wide-reaching internal changes even as another senior executive quits.

6 Novell 'net debuts

In the better-late-than-never category, Novell plans to unveil a series of Internet products tomorrow, sources say.

8 Building a better Internet

Explosive growth in Internet use and demand for high-speed access pipes to the 'net have forced major Internet service providers to install high-speed switching systems.

10 DG's technology plans

Data General laid out its technology plans for 1996 at last week's user group meeting in Washington. The move off the Motorola chip to Intel won widespread support, although users aren't in a hurry to migrate.

12 ATM-based multimedia

AT&T outlines its grand vision for meshing voice and data networks into one ATM-based network.

28 Marketing tools

A multimedia package promises to help Crush your competitors.

COMPUTER INDUSTRY**32 Chip vendors unite**

It seems like Intel's aggressive dominance of the chip industry is driving some of its rivals into each other's arms.

OPINION**36 Hero worship**

Hero worship has no place in the computer industry, Bill Laberis asserts.

37 Date fields

The "year 2000 problem" will prompt droves of IS managers to retire in the third quarter of 1999, Michael Cohn predicts.

37 IS progress report

Max Hopper says we're still far from the machine intelligence envisioned in *2001: A Space Odyssey*, but computers are racing ahead of the space program.

122 Data warehouses

Building data warehouses under the right kind of leadership is an opportunity to standardize data definitions and formats enterprise-wide, Charles Babcock says.



Your boss wants you to look into it. Vendors are pushing it. Why the heck should you care? What every buyer should know about workflow.
In Depth, page 93

Choice Cuts

Giant home center retailers must deliver know-how with their vast inventories. But is information technology the right tool for the job?

Management, page 77



CARL CORBELL

The Hillsborough County Sheriff's Department takes a high-tech approach to crime fighting: a development team to write programs that improve efficiency and cut costs.
Application Development, page 69

Technical Sections**DESKTOP COMPUTING****39 PC storage**

Many client/server users are confronted with an out-of-control storage management mess, with desktop PCs that often are stuffed with 1G byte or more of mixed corporate and personal information. Here's how companies are coping.

**41 Chip choices**

A recent flurry of announcements by major chip vendors promises a flood of user choices by mid-1996.

WORKGROUP COMPUTING**45 Scaling Windows NT**

Sales of NT are booming for departmental servers, but users say they are waiting for NT systems to scale higher before assigning them tasks that now run on large Unix servers.

48 Testing processes

A new tool makes it easier to map and test business processes. At the same time, it provides a way to export the information in the flowchart to other applications.

ENTERPRISE NETWORKING**53 Streamlining alarms**

Micromuse upgrades its management monitor. It lets administrators combine and filter alarms from diverse sources into one virtual view.

54 The Internet Page

Newspapers post help wanted ads on-line; a Halloween hot list.

**LARGE SYSTEMS****61 New DB/2 version due**

IBM's signature DB/2 database will get a major makeover in late November when a long-promised release finally ships.

64 Reporting tools

Actuate prepares to enter the crowded market for reporting tools with products that users and an analyst say fill a gap.

APPLICATION DEVELOPMENT**69 C++ gaining ground?**

Are corporate developers overcoming their fear and loathing of C++? Large organizations say the object-oriented language still doesn't meet their needs, but it is slowly gaining popularity.

72 Smalltalk in components

ParcPlace-Digitalk ships a new version of its VisualWorks Smalltalk development system that lets developers break applications into components.

Features**IN DEPTH****93 The word on workflow****CAREERS****101 Contracting out**

Technical skills alone aren't enough for IS professionals who want to make it as independent contractors.

103 Learning Notes

The next version of Notes will send many developers back to class to learn new skills.

MARKETPLACE**112 Doing Comdex**

Comdex attendees are setting their plans and priorities for the happening in the desert.

COMDEX

Etc.

Calendar 89

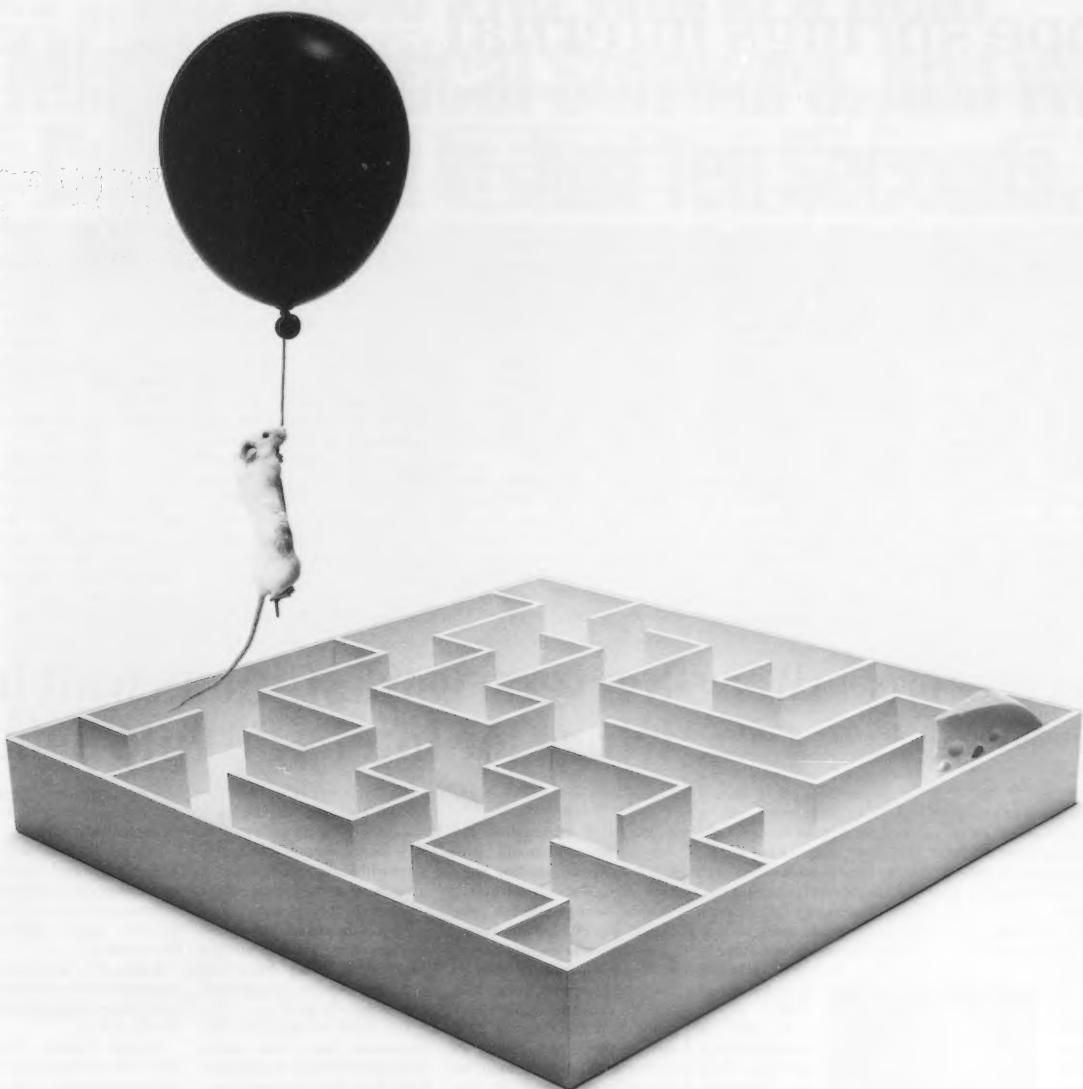
Company Index 118

Editorial/Letters 36

Inside Lines 122

Oct. 27 Stock Ticker 119

How to contact CW 118



LOOKING FOR A FASTER WAY TO LOAD YOUR DATABASE?

SyncSort UNIX can help you complete database loads, reorgs and reports in as little as *half the time*.

SyncSort combines high-speed sorting, versatile data manipulation features and the ability to handle a variety of data and file types. The result is a powerful, flexible tool for breaking database bottlenecks. To order SyncSort or for a free copy of our booklet, "Sorting and Relational Database Performance," please call or fax.

©1995 Syncsort Incorporated

syncsort

Tel (201) 930-8200 dept. 124
Fax (201) 930-8285 dept. 124

Hope springs internal

PC Co. chief Stephenson takes turn at fixing long-term issues

By Jaikumar Vijayan

Ever ready to give it the old college try, IBM has selected a new man with a new plan to straighten out the IBM PC Co. In the latest recycling of some long-standing business initiatives, Robert Stephenson, the PC Co.'s senior vice president and group director, last week outlined a series of steps the company is implementing as it tries to revitalize its sagging PC business.

The moves come when IBM appears to have once again slipped back into single-digit revenue growth in the third quarter. Its PC shipments grew only 7% worldwide in the third quarter of this year, while shipments at rival Compaq Computer Corp. were up 15%, according to estimates from International Data Corp. (IDC) in Framingham, Mass.

IBM attributed its slow growth to sluggish sales growth in Europe and the U.S. and price cuts in its portable lines.

Complicating matters was the sudden resignation last week of general manager Bruce Clafin, a 22-year veteran credited with making IBM a player in the notebook business. He is leaving to run Digital Equipment Corp.'s PC business.

Stephenson is the third person to take the helm of the PC Co. in less than two years. His latest efforts, which include sweeping changes in manufacturing, distribution and branding strategies, hark back to similar initiatives by at least two of his immediate predecessors, Rick Thoman and Robert Corrigan.

Those efforts include the following:

- A global manufacturing shift to a largely build-to-demand

model to shorten product turnaround time. IBM will split its various PCs, servers and notebook products into three specific manufacturing categories based solely on demand and manufacturing priorities.

- A substantial paring of system configurations to reduce product clutter and user confusion. For instance, IBM will offer as standard only 75-, 100- and 133-MHz Pentium PC models.

- Moving development of the company's PC server business from the midrange server group back into the PC Co.—reversing an earlier decision.

- Setting up a special mobile computing and communications group to explore market potential in wireless communication and mobile markets.

"The question is not of figuring out what to do. The question is to do it," Stephenson said in

an interview before Clafin left. "We are talking of work that is under way." The first result of IBM's latest initiatives will be felt as early as the first quarter of 1996, he said.

"The objective is to make us a much more reliable supplier than we are today," Stephenson said.

"Though IBM is still following rather than leading, they are getting more in tune with price changes," said Eric Libow, manager of PC support at Alamo Rent A Car Inc. in Fort Lauderdale, Fla. He added that IBM is "finally getting the message" that it needs a more streamlined commercial product differentiation.

But some observers remained skeptical. "The basic problem is

IBM still hasn't figured out how to succeed in the mass-volume, low-margin, short product life cycle PC business," said David Wu, an analyst at The Chicago Corp. in New York.

Observers point to vendors such as Compaq and Hewlett-Pack-

ard Co., which have grabbed market share from IBM with aggressive price cuts, reliable availability and short product cycles.

"Even if you have a good story to tell—and IBM doesn't right now—with all these changes going on at the executive level, it is hard to communicate that story, let alone deliver on it," said Ted Julian, editor at "The Gray Sheet," an industry newsletter published by IDC.



Robert Stephenson is the third person to head the PC Co. in less than two years

Weiler goes over to Wang

Latest to exit Lotus

By Tim Ouellette

The latest recipient of another high-level Lotus executive departure is Wang Laboratories, Inc., which snapped up Robert K. Weiler barely a week after he left the IBM fold.

Weiler, who was senior vice president of worldwide sales and marketing at Lotus Development Corp., will lead Wang's growing imaging and workflow software business. Deborah Wesemer has taken over Weiler's duties at Lotus. She formerly was in charge of Lotus sales for North and South America.

"I decided to leave Lotus at the end of August," Weiler said. "I like being at a company where what you do day-to-day has a direct impact on the business," he said, referring to his desire to take on a leadership role.

Weiler said he didn't think his departure and other recent management exits would seriously affect Lotus' future.



Robert Weiler will head up Wang's imaging and workflow business

It took a change of focus at Wang—from its bankrupt minicomputer past to its software sales—to attract Weiler's attention.

"If you told me earlier when I was at Lotus that I would end up at Wang, I would have expressed some surprise," Weiler said.

The Billerica, Mass.-based firm hopes to double its software sales from \$21 million this past fiscal year to about \$40 million over the next year, said Don Casey, Wang's president and a former vice president of Lotus' spreadsheet division.

Servers, workstations wait in wings for Intel's P6 chip debut

By Jaikumar Vijayan

A flurry of workstation and server announcements from major hardware vendors is expected to herald the launch of Intel Corp.'s next-generation Pentium Pro, or P6, chip this week.

In addition to the usual lineup of desktop suppliers such as Compaq Computer Corp., IBM, Hewlett-Packard Co., Dell Computer Corp. and Gateway 2000, Inc., vendors announcing P6 products will include some big iron stalwarts. Those are Unisys Corp. and Digital Equipment Corp., along with workstation vendor Data General Corp.

The announcements are expected to be harbingers of a new generation of servers that will give users near-minicomputer functionality at aggressive prices, observers said.

The Pentium Pro announcement essentially enables Intel to take its "Intel Inside" campaign into the server arena, said James Garden, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

"The Compaqs and the Dells of the world will now be able to take Intel's commodity engine and build extremely price-competitive servers. Big Unix server vendors are going to be pum-

meled by this price competition from the bottom," Garden said. Analysts said high-end Pentium Pro-based server configurations will begin to compete with traditional minicomputer-class products by the end of next year.

That is the reason enterprise vendors are jumping on the bandwagon. If they don't, they will face severe competition from those who do.

The 32-bit Pentium Pro chip represents Intel's most ambitious effort to push its architecture deep into enterprise computing territory.

Toward this end, Intel will make available full-featured server motherboards and even complete reference system designs that vendors can use to quickly build symmetrical mul-

tiprocessing, massively parallel processing and clustered-server implementations.

Several mainframe vendors already build such systems, but technology such as Pentium Pro is expected to provide less expensive, more standardized ways to do it.

A slew of PC and big iron vendors will demonstrate early versions of these systems in New York next week.

Typical Pentium Pro Windows NT workstations, which will form the bulk of this week's announcements, will start at \$4,500. Servers will ship by the second quarter of next year.

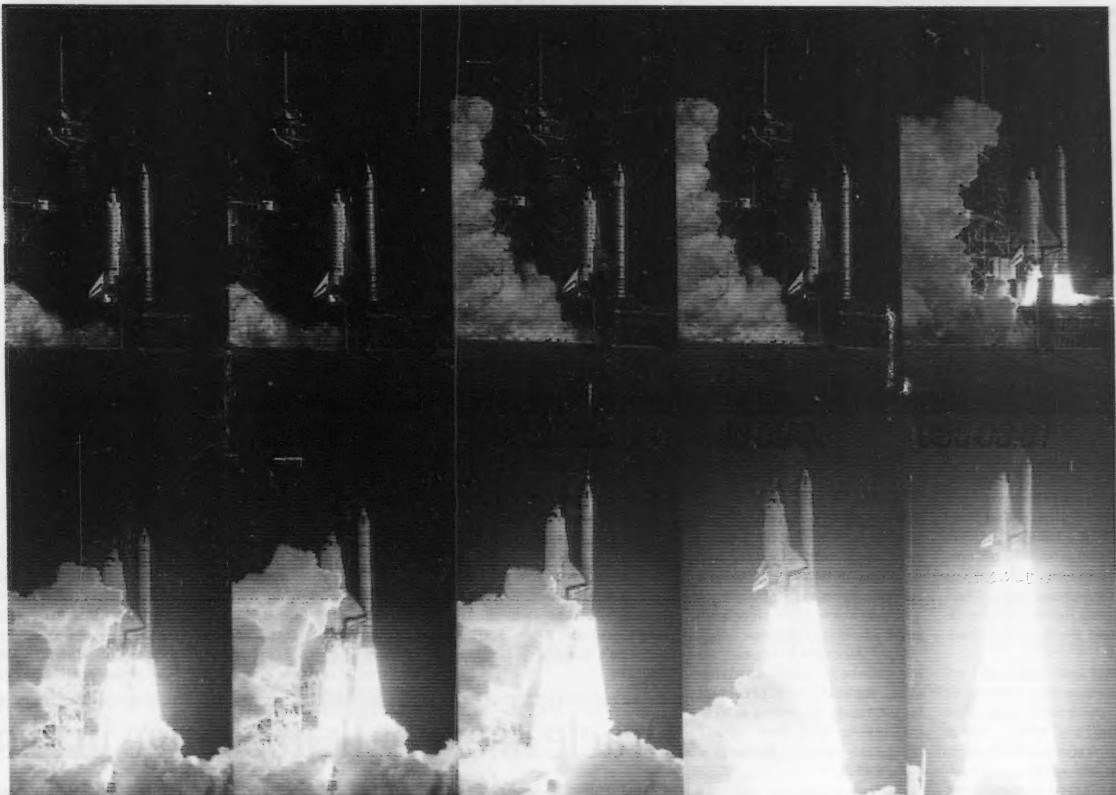
Users will have other chip choices by the second half of next year. See page 41.

Corrections

worth \$1,724 today.

Due to an editing error, the stock price in the Microsoft time line [CW, Oct. 16] was misleading. It said the stock was \$21 and rose to \$87 during Microsoft's 20-year history. The stock actually split five times, so one original share is

We Make The World's Best Mission-Critical Software. And We Can Prove It In Just Ten Seconds.



When every second is critical, you need database technology you can count on. Which is why you'll find CA-OpenIngres® on board wherever client/server applications need to be mission-critical.

Of course, it doesn't take a rocket scientist to figure out why. After all, no other company has more experience in mission-critical heterogeneous computing than Computer Associates. Or the confidence to back up that knowledge with technical assistance available 24 hours a day, seven days a week, at no extra charge.*

Put all that behind the exceptionally advanced technology of CA-OpenIngres, and you've got a global, enterprise-wide information management system that's simply unsurpassed. Which explains why it's used by over 9500 companies worldwide.

For more information on CA-OpenIngres, call 1-800-225-5224, Dept. 12102. Because with the right database technology, there's no telling how far your business can go.

**COMPUTER[®]
ASSOCIATES**
Software superior by design.

New CA-OpenIngres®

© 1995 Computer Associates International, Inc., Islandia, NY 11788-7000. All products referenced herein are trademarks of their respective companies. *Available only to licensed CA-OpenIngres users who are both on active maintenance and whose accounts are current.

Delay forces change in IBM storage plans

New Ramac on deck as Seaside slides

By Craig Stedman

The tide isn't coming in as planned for IBM's multiplatform Seaside storage devices, and the change is forcing a major course correction as the computer giant struggles to stay at the crest of the mainframe disk market.

Engineering delays on the much-anticipated Seaside architecture, which will connect multiple disk and tape controllers in a fault-tolerant ring that supports both mainframes and other servers, have caused a chain of events at IBM:

- Seaside deliveries have been postponed from the middle of next year to 1997.

- The delay is pushing IBM back to the drawing board to design a 360G-byte version of its Ramac mainframe disk array for shipment next year. Ramac work was supposed to end with a 180G-byte model that became available last week.

- IBM also is resurrecting plans to double the amount of data that its 3990 Model 6 disk controller can handle. The increase to 360G bytes was scrapped earlier this year to save IBM's storage budget for Seaside-related work.

Analysts said they don't expect Seaside and its Seaside storage controller to hit the beach until mid-1997 — which would be a year behind schedule — at the earliest. IBM already has lost its dominant position in mainframe disk shipments and is running neck and neck with EMC Corp. Rely-

ing on the aging 3990 controller for almost two more years will further test IBM's ability to retain customers.

"You have to give IBM credit for keeping the 3990 alive, but the bottom line is that it's an outdated architecture," said David Vellante, an analyst at International Data Corp. in Framingham, Mass.

Kept waiting

Barnett Banks, Inc. in Jacksonville, Fla., has almost a terabyte of Ramac capacity installed and expects to buy an equal amount of Ramac 2 by the end of next year.

But Seaside's delay will force the bank to postpone its plans to merge its mainframe and Unix storage under a single management scheme, said Michael Pudl, manager of resource management at Barnett's information systems unit.

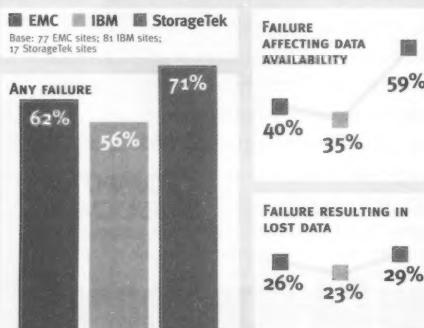
"Strategically, what we'd like to do is have one central location for all of our data," Pudl said. "This definitely pushes some of our time lines off, and that costs us money from a management perspective."

Other users were more sanguine about the Seaside delay. "If they got it [out next year], I'd love to have it," said Gerard Higgins, assistant vice president for information services at Nynex Corp. in New York. "But I think I can live with [Ramac] for quite a while."

Storage issues affect users from mainframes on down. See Closer Look, page 39.

Feel the pain

Users of mainframe disk arrays report different types of failure rates



Source: Xephon PLC, Newbury, Berkshire, UK

COMPUTERWORLD OCTOBER 30, 1995

News

Novell to feed NetWare's Internet-hungry users

By Kim S. Nash

Novell, Inc. users holding their breath for NetWare-based World Wide Web servers can exhale.

The vendor plans to unveil tomorrow a series of Internet products based on source code licensed from a start-up in Bedford, Mass., according to sources familiar with the deal.

Novell will rename and resell 10-month-old American Internet Corp.'s SiteBuilder Web server starting in the first quarter of next year, the sources said. A Novell official confirmed that the Provo, Utah, firm will unveil Web products at the Internet World show in Boston this week but declined to provide further details.

Ignored no more

The estimated 45 million NetWare users have been largely ignored when it comes to Web technology, analysts said.

Framingham, Mass.-based Process Software, Inc. also plans to ship a Web server for NetWare before year's end. But other Web software vendors, including Netscape Communications Corp. and Open Market, Inc., don't offer any NetWare products.

Novell itself is late in providing Web capabilities to its bread-and-butter users, said Stan Lepeak, an analyst at Meta Group, Inc. in Stamford, Conn.

NetWare users "want to get on the 'net,' but they don't want to have to drag another operating system in to do it," Lepeak said, referring to numerous Web products available for Unix and

the chance to beta-test American Internet's products, he said.

Boston Edison has experimented with Unix and NT Web servers for a small information systems application "to get a feel for the Web while we figured out how to get there with NetWare," he explained.

SiteBuilder, which was announced last week, runs as a

Webware

Novell plans to resell American Internet's SiteBuilder Web server early next year; American will sell the product beginning in December

Product: SiteBuilder

Platforms: NetWare 3.11, 3.12 and 4.1

Administration: Can be managed from NetWare, DOS or Windows PCs

Price: \$1,495 (\$1,995 with application development tools from Vermeer Technologies in Cambridge, Mass.)

Microsoft Corp.'s Windows NT.

Boston Edison Co., for example, has had nowhere to turn to fulfill its plans to build internal Web sites for human resources, news posts and other applications, said John Dubiel, manager of planning and technology.

The utility, which runs 100 NetWare file servers, jumped at

NetWare Loadable Module on Novell's operating system, Version 3.x and higher. It was written for NetWare, unlike the rival product from Process Software, which is a port of a Unix version of Process' Purveyor server.

Help wanted on the Web, plus Halloween tips. See page 54.

Oracle users balk at change in show

By Dan Richman

Some users and business partners of Oracle Corp. are worried that the company's quest for customer accounts may wreck the annual education-oriented International Oracle Users Week (IOUW).

A marketing event called Oracle Open World is scheduled to make its U.S. debut next fall in San Francisco at or about the same time as IOUW. "Everyone would lose if the two events started to compete with each other," said Mike Corey, chairman of the International Oracle Users Group-Americas, the national Oracle user group.

Oracle Chief Executive Officer Larry Ellison confirmed that IOUW and Open World will be combined next year but said, "We are not doing away with user week at all."

Pairing the events might work out fine, or it might limit IOUW's educational content and diminish its independence from Oracle's corporate agenda, said several user group officials who asked to remain anonymous.

Conflict of interest?

"Oracle already goes ballistic if we make presentations on PowerBuilder [a tool used by Oracle developers but owned by rival Sy-

base, Inc.] or on older versions of its products," said one user group official. "If Oracle were in control of IOUW/Open World, it would probably eliminate those presentations."

Zack Nelson, Oracle's vice president of marketing, said the company wants to sponsor a single, national event for the national user group and other Oracle user groups, such as applications users. He said the user

group would retain control of presentations relevant to them.

Oracle user group officers say IOUW is an intensive, education-oriented gathering of committed Oracle users who pay about \$1,000 each to attend the weeklong gathering. About 8,000 people attended IOUW in September, and many stayed for the entire conference.

Oracle Open World has been a marketing-oriented event held without the user group's input. For the past few years, it has been held in Japan and attracted as many as 80,000 people.

Even some of Oracle's vendor partners said replacing IOUW with Oracle World would be a mistake.

"Stressing quantity of leads over quality isn't the game anymore," said Cameron Jenkins, vice president of marketing at Acucobol, Inc. in San Diego, an Oracle business partner.

Database Performance

The TPC-C™ benchmark is the industry standard test for measuring database On-Line Transaction Processing (OLTP) performance. On July 24, Hewlett-Packard published the record-setting 5369 tpmC Oracle7 benchmark.

ORACLE7

BEST: 5369 tpmC

ORACLE7 HP 9000 T500

5369

ORACLE7 HP 9000 K410

3809

Informix Sun SPARCcenter 2000E

3534

Informix AT&T 3555

3313

Informix AT&T WorldMark 4100S

2692

Informix Bull ESCALA Rack R201/8

2660

Informix HP 9000 K400

2616

Sybase Digital Alpha 2100 4/275

1708

Informix Bull ESCALA Rack R201/4

1563

Sybase Compaq ProLiant 4500 5/100

1517

Informix NEC UP 4800/690

1489

Informix DG AV 9500+

1416

Sybase HP 9000/800

1403

Sybase IBM RS 6000 PowerPC J30

1298

Informix NEC UP4800/675

1245

Sybase Sun SPARCserver 20

1064

Informix Fujitsu/ICL Superserver K474s

1002

Sybase IBM RS 6000 390

902

Informix NEC UP 4800/650

900

Informix SNI RM 400 Model 630

874

Informix

BEST: 3534 tpmC

Sybase System 10

BEST: 1708 tpmC

These are the top 20 Oracle, Informix and Sybase TPC-C benchmarks as of September 29, 1995.

Oracle7's superior OLTP performance is the result of an advanced architecture with features like non-blocking consistent queries and unlimited row-level locking—features that Sybase and Informix don't have. For proven scalable performance on SMP, clustered and massively parallel systems, call Oracle at 1-800-633-1071, ext. 8101.

ORACLE®

Enabling the Information Age

'net providers will overhaul network

Fast switches are in; router role is recast

By Bob Wallace

Explosive growth in Internet use has spurred demand for higher-speed access pipes to the 'net, forcing major Internet service providers to install high-speed switching systems.

That was the impetus behind last week's announcements from UUNET Technologies, Inc. and Netcom On-Line Communications Services, Inc. that they will overhaul their router-based networks in favor of Cascade Communications Corp.'s high-speed switches.

Analysts lauded the strategy, claiming users have everything to gain and nothing to lose.

"The switch approach lets Internet service providers easily scale [up] their networks and offer reliable services, whereas routers typically don't scale well and can cause problems transmitting overhead," said John Morency, a principal at The Registry, Inc., a consultancy in Newton, Mass. "Cascade switches support higher performance than even high-end routers. And by optimizing their networks, Internet providers realize savings that can be passed along to users."

Problems with routers in large networks aren't unusual. It was a router anomaly that caused a network-wide brownout on the Internet in late August [CW, Sept. 11]. Lending further credibility to the switch approach, MCI Communications Corp. opted for Asynchronous Transfer Mode switches rather than high-end routers to form the backbone of its recently announced network for the supercomputer centers, which were the first tenants on the Internet.

Users said Internet providers have no choice but to move to the higher-speed switched network architecture.

"This is a must-do for providers because, from a user perspective, the winning provider will be the one that delivers the service at the quickest speed and the lowest cost," said Barbara Maaskant, director of informa-

tion services at the Rollins School of Public Health at Emory University in Atlanta. "Users are already showing signs of becoming frustrated with bottlenecks and bandwidth limitations."

Ongoing construction

Bandwidth on the Internet can be compared to the country's highway system. As more and larger on-ramps have been added, and as traffic has increased, the need to expand the highways has become a pressing issue.

The Internet comprises large routers linked by several T1 lines and some 45M bit/sec. T3 lines. The Cascade switches will support multiple T3s, next-generation 155M bit/sec. links next year and 622M bit/sec. links in 1997.

The tripling of link speed and installation of the Cascade switching systems addresses the fast-growing use of the Internet as a business tool.

In fact, Internet service providers have furthered their networks to keep pace. Netcom surged from 50 network entry points in January to 200 in September.

UUNET's network offers users local access from 100 U.S. cities, and the company plans to reach the Internet from 300 cities worldwide within the next two years.

Performance Systems International Network (PSINet) already is installing Cascade switches in its network. Analysts said other service providers still rely on the router-based approach, but their migration to the switch-based approach is inevitable.

"You can get away with one or two high-end routers if your network isn't too large," said Christine Heckart, director of broadband consulting at TeleChoice, Inc., a Verona, N.J., consultancy. "But once an Internet provider's network approaches the size of UUNET's or PSINet's, you need switches to consolidate traffic and control [WAN] costs."

& A help wanted cooperative may bump up Web usage. See page 54.

News Shorts

Phone service jockeying continues

AT&T Corp. plans to ask Connecticut regulators to let it offer local telephone service for business and residential customers starting early next year as part of a nationwide push into local markets. The AT&T filing is part of a larger push for position as Congress moves toward a deregulation of phone service that would allow regional Bell operating companies to enter long-distance markets and let interexchange carriers invade local markets. AT&T filed for similar permission in California Sept. 1, and it has already won permission to provide service in Chicago and Grand Rapids, Mich. Gaining regulatory approval is a minor hurdle compared with hammering out the details with the local phone company. For example, AT&T has been unable to reach an agreement with Ameritech to allow delivery of service in Chicago and Grand Rapids.

Notes 4.0 enters final beta

Lotus Development Corp. has released the final beta version of Notes 4.0 to 10,000 business partners. This is the final beta phase for the product, which is set to ship by year's end.



The Cambridge, Mass., division of IBM also announced that Notes:Newsstand, a service for delivering business publications to Notes users, will be offered on AT&T's Network Notes, the IBM Global Network and WorldCom, an international Notes network.

Cisco to buy NTI

Cisco Systems, Inc. last week continued its buying binge with an agreement to buy Network Translation, Inc. (NTI), a Palo Alto, Calif.-based maker of address translation and Internet firewall equipment. No sum was specified.

Libel suit dropped

New York investment firm Stratton Oakmont, Inc. last week agreed to drop its \$200 million libel suit against Prodigy Services Co. in White Plains, N.Y. In a carefully worded statement, Prodigy said it was "sorry if the offensive statements" posted on Prodigy's online service harmed the plaintiff's reputation. However, Prodigy will still try to overturn the New York court's prior ruling that Prodigy is a publisher liable for its on-line content.

Netscape cuts prices

Mountain View, Calif.-based Netscape Communications Corp. cut its prices by as much as 57% on its Unix-based and Microsoft Corp. Windows NT-based World Wide Web servers last week. The NT version of Netscape's Commerce server went from \$1,495 to \$1,295; the Unix version dropped from \$5,000 to \$2,995. Netscape's Communications server for NT was reduced from \$795 to \$495, and the Unix version fell from \$2,995 to \$1,295.

Maxtor in buyout discussions

Troubled hard disk maker Maxtor Corp. revealed it is in acquisition discussions with Hyundai Electronics Industries Co. Hyundai Electronics is a subsidiary of Korea's Hyundai Business Group, which owns 37% of the San Jose, Calif.-based company. Separately, Maxtor said it lost \$44.5 million on sales of \$281.4 million in its second fiscal quarter. It lost \$54.7 million on sales of \$174.4

million in the same quarter last year.

KnowledgeWare suits settled

Sterling Software, Inc. in Dallas said last week it had settled a class-action lawsuit filed by shareholders against KnowledgeWare, Inc. for \$17 million in cash and stock. Sterling acquired KnowledgeWare in November 1994, but the settlement will be paid by KnowledgeWare's insurers and from stock placed in escrow at the time of the merger.

MGM's CIO calls it quits

Edward N. Altman, Metro-Goldwyn-Mayer, Inc.'s vice president of MIS since January 1994, will leave the company Nov. 3. Altman said he has completed his mission at the Santa Monica, Calif.-based movie-maker and will begin looking for a new information systems position in the entertainment industry.



MGM's Edward N. Altman

Digital info via TV

The InterCast Group, a consortium led by Intel Corp. of hardware manufacturers, software developers, broadcasters and cable companies will soon provide PC users a way to receive digital information, such as software, Web pages and magazines, over a broadcast television signal. En Technology Corp. in Keene, N.H., plans to ship the first products based on the InterCast Group's technology by January.

EMC buys McData

EMC Corp. in Hopkinton, Mass., has signed a deal to buy McData Corp., a maker of network switches for connecting host systems and storage devices in data centers. Ironically, McData's main product is a switch for IBM's Escon fiber-optic interconnect, and IBM is EMC's archrival in the mainframe disk market.

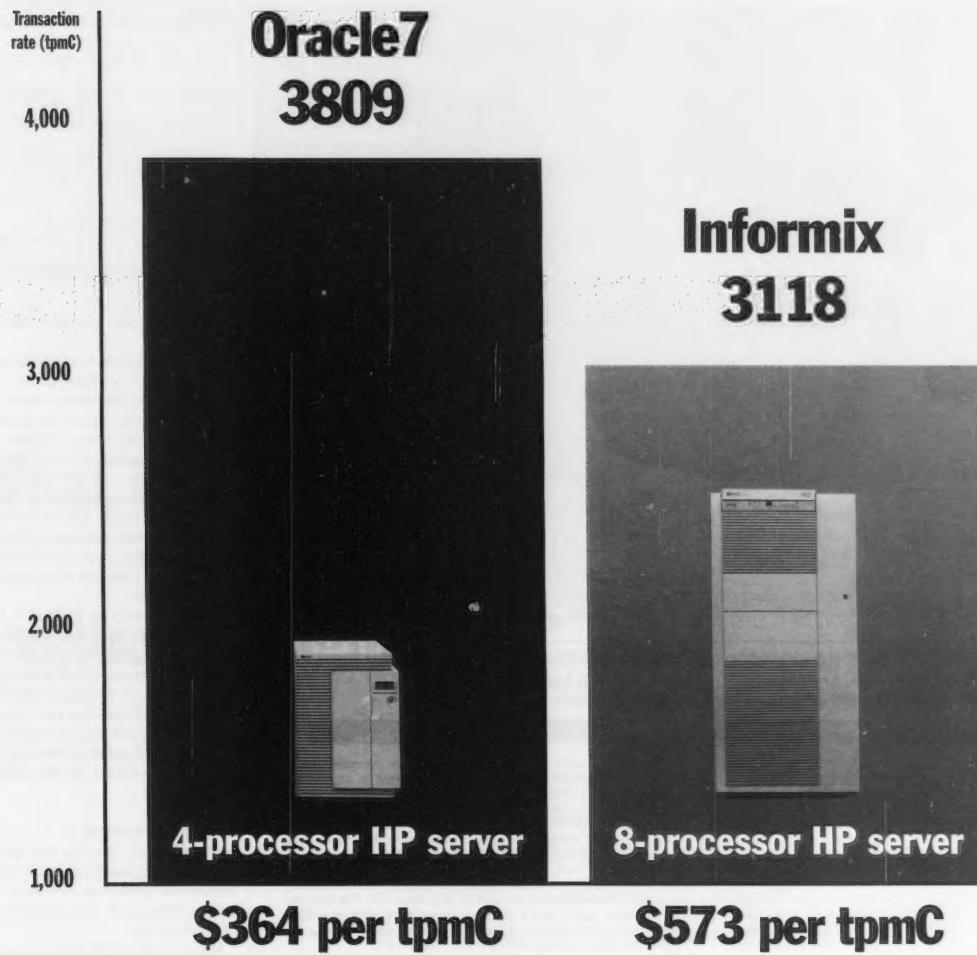
EMC to open up Symmetrix

EMC Corp. in Hopkinton, Mass., next week will open up its Symmetrix 5000 mainframe disk arrays to data from pieces of not-so-big iron, sources said. Thanks to a new SCSI interface, Symmetrix customers will be able to attach both mainframes and Unix systems to a single array. However, storage capacity will have to be partitioned between the two boxes because EMC doesn't enable them to share the same data.

Oracle7 On A Little HP Server Is Faster Than Informix On A Big HP Server

And It's Cheaper, Too.

Faster. Cheaper. Better. Any Questions?
Call Oracle 1-800-633-1071, ext. 8104.



The TPC-C is the industry standard test for measuring database On-Line Transaction Processing (OLTP) performance and price/performance. Benchmarks published by Hewlett-Packard show that Oracle7 on a small 4-processor HP server runs faster than Informix on an 8-processor HP mainframe replacement superserver. Amazing. And because Oracle runs so fast on a small computer, you have an opportunity to save a lot of money as well as a lot of time.



ORACLE®
Enabling the Information Age™

\$ Cheaper \$

©1995 Oracle Corporation. Oracle7 is a trademark of Oracle Corporation. All rights reserved. Oracle HP 9000 K410, \$364/tpmC, TPC results as of September 29, 1995. Informix HP 9000 T500, \$573/tpmC, TPC results withdrawn as of September 26, 1995. TPC is a trademark of the Transaction Processing Performance Council. All other trade names referenced are of their respective owners.

DG's Intel move gets user nod

By Neal Weinberg
WASHINGTON

Data General Corp. drew a technology road map last week that takes the company from the dead-end Motorola, Inc. 88000 chip to the fast lane of symmetrical

multiprocessing servers based on Intel Corp. processors.

DG rolled out its first Intel-based products last week: Pentium-based Avion departmental and enterprise servers. It will add Pentium Pro processors early next year; machines with commodity,

four-processor motherboards from Intel by midyear; and systems that link multiple motherboards by the end of 1996.

Attendees at the North American Data General User Group here said they wouldn't necessarily place their orders at the show, but they were glad that an

upgrade path had been cleared.

Larry Spanier, manager of information systems at E. R. Moore Co. in Chicago, said he has stayed with DG's older MV systems because of the expense involved in moving his custom applications used to design items such as choir robes.

"What I heard today is very significant," Spanier said. Because DG's switch to Intel opens up a new world of applications, Spanier said he is leaning toward



ATTENTION DATABASE DESIGNERS.

S-Designer is the tool with the power, intelligence, and ease of use you've been looking for.

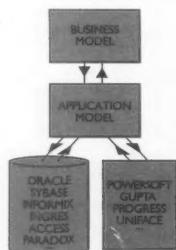
Superior database modelling

■ To unlock the power of S-Designer, just open its friendly Windows interface and describe the application's requirements in a generic model of business entities and relationships. ■ Then, for your specific database, S-Designer automatically generates a separate graphical representation of its structure where you can optimize tables, references, integrity rules, indexes and views. ■ Throughout your application's entire life cycle, this two-level Information Engineering method, plus detailed analysis reports, guarantee superior database design and error-free maintenance. ■ No matter what the size of your project, S-Designer's powerful features put you in complete control. Which means S-Designer handles large models through convenient submodels; and with our workgroup edition, lets you share design information through a comprehensive SQL project dictionary.

Databases you can depend on

■ Whether you want to create, reverse-engineer, maintain, upsize, downsize or rightsize your database, S-Designer is the smart choice. ■ And S-Designer does it right for over thirty databases including Oracle, Sybase, Informix, Ingres, SQL Server, Progress, DB2, AS400, SQLBase, Paradox, Access, FoxPro and many others. From the design models, S-Designer automatically creates and maintains the optimal database structures including constraints, views, triggers and stored procedures. ■ For maximum client/server performance, S-Designer fully bridges with PowerBuilder, Gupta SQL Windows and other leading 4GL tools. ■ The bottom line? If you're looking for a database design tool with incredible power, intelligence, and ease of use, take a close look at S-Designer. It's the easy way to design truly perfect databases.

Now, design the right way!
With S-Designer's powerful and fully integrated modelling features, you can design, create, reverse-engineer and maintain over 30 databases. Plus, you can interface with your choice of client/server tool!



Free S-Designer evaluation kit

With S-Designer it's actually easy to design perfect databases. But don't take our word for it: prove it to yourself. Call right now and we'll rush you a fully-functioning copy of S-Designer that lets you evaluate all its powerful features.



Powersoft

Building on the power of people.

POWERSOFT IS THE OPEN TOOLS DIVISION OF SYBASE. Powersoft Corporation, (508)287-1500. <http://www.powersoft.com>. Powersoft Europe Ltd., United Kingdom, +44 1494 555555. American Powersoft Corporation Pre Ltd., Singapore, +65 338-0018. All trademarks and registered trademarks are property of their respective owners.

COMPUTERWORLD OCTOBER 30, 1995

Data General goes Intel

PRODUCT	AVION 5800 (ENTERPRISE SERVER)
Chip	133-MHz Pentium
Memory	2G bytes
Platforms supported	Windows NT, DG/UX
Price	\$70,000 (two-processor system); \$160,000 (eight-processor system)

the new Avions. "It's not if, but when," he added.

Similarly, James B. O'Loughlin, director of IS at L. S. Starrett Co. in Athol, Mass., said he has been wrestling with the issue of moving off his proprietary MV system. "We know we have to move forward," O'Loughlin said. "But what's the carrot?"

The IS director said the new manufacturing applications written for the Intel architecture could be the deciding factor. DG is "paving the way for the future; the only thing is I have to catch up with it," he added.

Not everybody is thrilled with DG's move to Intel, however. "For me, it's a problem," said Eric Raskin, president of computer services at Listworks Corp. in Pleasantville, N.Y. Raskin said he worries that it will become even more difficult to obtain software for his MV hardware. "It's like pulling teeth to get people to develop software for the 88000 chip now," he said.

Receptive crowd

But the overall reaction has been positive, said Thomas Bounds, president of Hometown Computer Products, Inc. in Magee, Miss., and vice president of the DG user group.

Many of the older MV customers are "not in as big a hurry" to move off their platform, Bounds said. But newer customers will be moving rapidly to the Intel-based Avions, especially because the new systems run Microsoft Corp.'s Windows NT.

DG says its new servers will run more than 15,000 applications, including all the leading database and enterprise software. That includes 7,000 shrink-wrapped Windows NT applications.

Users were also pleased with DG's financial results, which were announced last week. Snapping a long losing streak, DG turned a \$1½ million profit in its fourth quarter, with revenue increasing from \$293 million to \$313 million.



Micro Focus® Dialog System™ 3270

Don't pack around an old interface when you can replace it with a few clicks of the

What if you could move your CICS applications to a GUI without roughing it?

mouse. With Micro Focus Dialog System's 3270 feature, you can take host- or workstation-based CICS or IMS

screens and automatically translate

them into Graphical User Interfaces. No C programming or API calls. No changes in business logic. No sweat.

The result is an interface that's cleaner, easier to use and integrated with other desktop applications. Then, once you've moved your interface logic to the PC, you can modify it or add new functions without impacting the business logic. Dialog System's 3270 feature makes the first step to Client/Server an easy one. It's one of the many tools within Micro Focus Dialog System; a system that gives you rapid development of GUI interfaces and client/server applications with little or no additional programming.

Make sure your computing environment is powerful enough to grow and evolve your enterprise-wide applications. Only Dialog System has all the tools you need to manage the changes in your business without getting in over your head.

See for yourself.
Contact Micro Focus at 800 MFCOBOL Ext. 1203 and ask for your copy of the Micro Focus CD. On it, you'll find descriptions and interactive demonstrations of Micro Focus development tools.



A Better Way of Programming™

MICRO FOCUS®

Micro Focus is a registered trademark. Dialog System and "A better way of programming" are trademarks of Micro Focus Limited

News

AT&T stresses multimedia

Single platform to incorporate video, graphics, apps

By Neal Weinberg

AT&T Corp. today will outline a broad vision for integrating voice and data networks into one multimedia system based on Asynchronous Transfer Mode (ATM) technology.

The idea is to enable individual PC users to begin and end videoconferences with the ease of a phone call and let them store and manipulate the contents of those sessions as easily as they store and retrieve data now.

In the first step of a long product rollout to achieve that goal, AT&T's Global Business Communications System unit will unveil a Multimedia Communications Exchange server that links phone switching equipment with the local data network. The name of the entire



First Albany's Helen O'Connor: It sounds expensive'

product family is BusinessWorks.

The company will also announce communications middleware that will allow existing client/server applications to run on the new servers, according to Howard Hecht, an analyst at Decisive, Inc. in Sterling, Va.

"This is another level beyond anyone's current product," Hecht said. "This is the first time anyone has taken the 'multi' part of multimedia to heart." Instead of focusing simply on video, AT&T is incorporating audio, graphics and applications into one platform, he said.

Pricey plan

"It sounds interesting, and it sounds expensive," said Helen O'Connor, vice president and director of telecommunications at

First Albany Corp. in Albany, N.J. "If you have a communications server hooking up to ATM for video, we're talking extensive bandwidth, and that usually equates to expensive costs."

O'Connor said she already has videoconferencing from PictureTel Corp. that runs on inexpensive Integrated Services Digital Network (ISDN) lines.

But Sarah Dickinson, an analyst at Personal Technology Research, Inc. in Waltham, Mass., said AT&T is going far beyond just videoconferencing. The company is developing a LAN/WAN gateway for extending client/server to the wide-area network.

And while ISDN represents one alternative to ATM, the consensus of network managers is that "ATM will rule the world," said Rosemary Cochran, an analyst at Vertical Systems Group in Dedham, Mass.

AT&T is laying out a road map for "how you get there from here," she said. The company is telling corporate accounts that

they don't have to replace their private branch exchange telephone switches or their data servers. They can plug both systems into this new communications server, which will become an essential ATM switch, Cochran said.

"This is a big step, and it's the right direction," Cochran said.

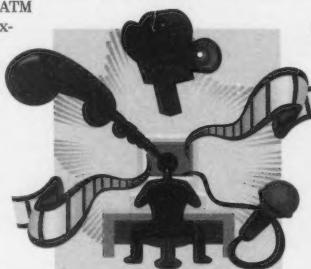
"They are setting up a framework for how you would do business in the future."

Eye on the future

Robert Larson-Hughes, a partner at McGladrey and Pullen, a Minneapolis-based accounting and consulting firm, said he is looking forward to being able to merge the data and voice networks at the company's 70 locations.

"The place we would really save is on the amount of people effort it takes to manage and maintain such a network," Larson-Hughes said.

He added that his company is extremely interested in videoconferencing and is looking to add Intel Corp.'s ProShare videoconferencing system to Network Notes, AT&T's version of Notes.



AT&T's multimedia plan

THE GOALS: To let users easily begin and end videoconferences and quickly store and manipulate the contents of those sessions.

THE MEANS: A server that links users' switching gear with the local telephone network and middleware that lets existing applications run on the new servers. This is accomplished via ATM networks.

Win 95 bug fixed

Client security gap affects few users

By Laura DiDio

Microsoft Corp. acknowledged last week that it discovered, and has since fixed, a security problem with the file and printer sharing facility in Windows 95 clients.

The potential security hole could have affected, and actually could still affect, a small percentage of Windows 95 clients attached to Windows NT and Novell, Inc. NetWare-based servers.

"Businesses that turned on the Windows 95 File and Printer Sharing capability could have unwittingly created a situation where unauthorized network users or hackers could gain read-only access to Windows 95 PCs, including sensitive corporate data," said one network administrator at an East Coast financial institution, who asked not to be identified. The administrator became aware of the potential flaw two weeks ago.

The fix for the security shortfall is a set of free updated net-

work drivers, which Microsoft released on various on-line services last week, said Windows 95 product manager Rob Bennett. Those services include CompuServe, America Online, Prodigy and The Microsoft Network. Users can also call Microsoft's FastTips line at (800) 936-4200.

Bennett emphasized that only those users who physically enabled the File and Printer Sharing capability in Windows 95 are affected. "To the best of

our knowledge, few, if any, users were affected," Bennett said.

To be susceptible to the security flaw on NetWare and Windows NT Server networks, users would have to configure their Windows 95 PCs to share files and printers with other network users deploying File and Printer Sharing. They would also have to manually enable the remote administration feature or install Microsoft Remote Registry Services, Bennett said.

Microsoft also issued an update last week to correct a similar problem with Windows-based networks and Samba Corp.'s Unix shareware net-

work client called the Server Message Block (SMB) client. The bug in the SMB client lets users send illegal networking commands.

"The Samba client is the only known SMB client at this time" that has the problem, Bennett said. "But again, users or network administrators would specifically have to configure their systems and know the exact steps to send the illegal commands over the Samba shareware."

& Another network headache, storage management, gets a Closer Look. See page 39.

Microsoft offers corrective measures

To determine if your business enabled the File and Printer Sharing facility, choose the Networks Option in the Windows 95 Control Panel and check the dialog box.

If "File and Printer Sharing" appears in the dialog box, it is installed. Users should then take the following steps to update multiple desktops on a NetWare network:

- If you haven't installed Windows 95 or are using a server-based setup: Copy the file "nwserver.vxd" from the \\Windows\System directory to the directory on the network.

- If Windows 95 is already installed and runs locally on client desktops: Click on the heading below, "Updated driver for File and Printer Sharing for NetWare Net-

works." Save the file in a publicly available directory.

- For automated distribution, choose one of the following options: Either incorporate the nswrvupd.exe that you download into a network log-in script or create a run-once policy using system policies or use Microsoft's Systems Management Server or another automation tool.

—Laura DiDio

Informix to buy tool maker

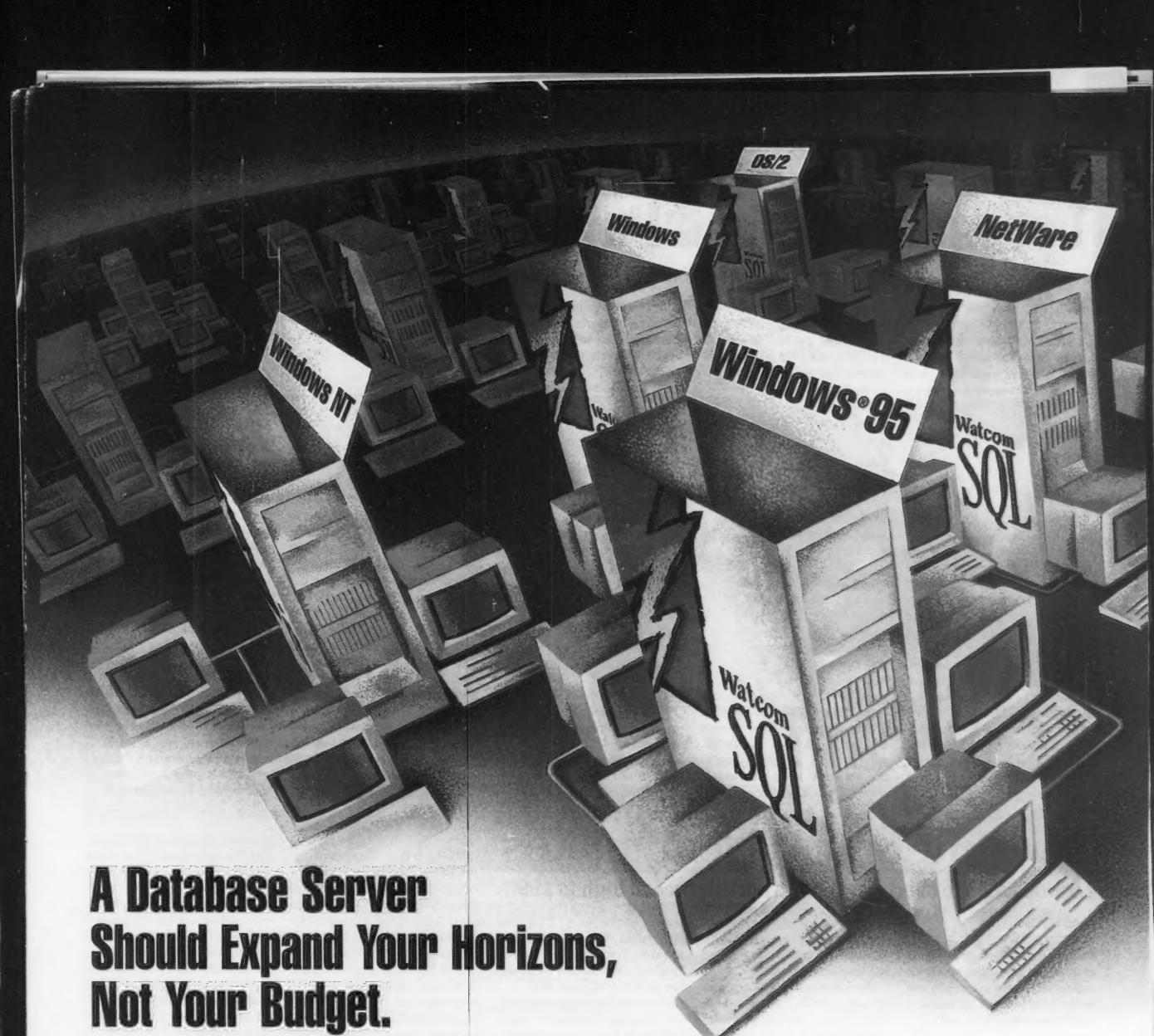
By Dan Richman

Racing to keep up with the competition, Informix Software, Inc. last week said it will buy Stanford Technology Group, Inc., a multidimensional-analysis tool maker in San Francisco.

Stanford Technology makes Metacube, a product that lets users view data in three or more dimensions — such as by time, place and product — rather than the two dimensions that relational database management systems typically allow (see related story, page 61).

Informix's purchase, to be completed as a stock swap, follows Sybase, Inc.'s recent purchase of similar technology and Oracle Corp.'s acquisition of a company specializing in an alternative technology based on a multidimensional database management system.

Informix will integrate some features of Metacube into its RDBMS, said Marianne Elkholz, Informix's director of data warehouse marketing. She wouldn't say when the integration will take place or which features would be integrated.



A Database Server Should Expand Your Horizons, Not Your Budget.

Presenting Watcom SQL, the industrial strength database server for simple and affordable widespread deployment of PC client/server applications. Watcom SQL's advanced technology offers unparalleled simplicity of operation and performance, making it ideal for workgroup, desktop and mobile applications — from head-quarter's departments to remote branch offices to mobile field personnel on the go.

Installed and Running in Minutes. Setting up Watcom SQL is quick and easy, taking only a few minutes. But for real convenience, many users build it right in to the installation process of their applications. Imagine, real SQL database deployment so easy that end-users don't even know it's there!

High Performance Right Out of the Box. The self-tuning query optimizer is the key to Watcom SQL's blazing performance. Not only does it tune each individual query, it delivers high speed performance without administrator attention. Better still, it comes as standard equipment in every box.

Big Performance. Small Footprint. Not only is Watcom SQL powerful, it's incredibly efficient as well. Because it was designed for PC environments, it minimizes its use of disk and memory — just 4 MB of disk and less than 1 MB of memory. And Watcom SQL also runs quite comfortably on the same

machine as an application — particularly important in mobile, standalone and peer-to-peer networks. Of course, on advanced servers, Watcom SQL shines by taking full advantage of both increased memory and RAID storage.

Yes, The Price Really is That Low. Watcom SQL is priced to make widespread deployment affordable. A 6-user server is only \$795*. And for volume deployments, our "Gold Disk" licenses offer significant savings. So, though your budget may not be limitless, your horizons are with Watcom SQL — from one server to thousands on Windows, Windows®95, Windows NT, NetWare or OS/2. With hundreds of thousands of servers already installed, Watcom SQL is the proven choice for widespread, industrial strength deployment.

Expand your horizons. Call us today for the opportunity to try Watcom SQL 4.0 free for 30 days, or to reserve your seat at a free half day seminar on "Cost-effective Widespread Deployment of Client/Server Solutions" in a city near you.

1-800-265-4555

Powersoft
Watcom Products Division

News

Users: Revamped Paradox 7 easier to use

Borland's latest effort could recapture lost market share

By Cheryl Gerber

If Microsoft Corp. hasn't already stolen the show, then Borland International, Inc. may have a shot at capturing some of the desktop database market with the Windows 95 and NT version of Paradox. Slated for introduction today, the product will ship in December.

By all accounts, Borland has eradicated in the 32-bit beta version of Paradox 7 every weak point in its predecessor, Paradox 5. "It's a huge product overhaul," said Dan Ehrmann, a consultant and president of Kallista, Inc. in Chicago and a Paradox 7 beta tester.

Beta testers said the chief improvement in Paradox 7 is that it is easier to use. Borland's extensive use of Experts, which are equivalent to Wizards in Microsoft's Access, has made the product easier for less-experienced users as well as developers to use. The import/export

process, electronic-mail merging and the formation of charts, tables and reports are examples of more than a dozen processes that have been automated by Experts.

Paradox 7 also touts more than 100 developer productivity tools for visual and rapid application development. The 32-bit version is integrated not only with Novell, Inc.'s PerfectOffice suite, with which it is bundled, but also with Microsoft's Office 95.

Better than Access?

Some Paradox beta testers are Access users. They said they couldn't help but compare the two database products. "Paradox 7 is a better upgrade than Access 7, and the reason is forward compatibility," Ehrmann said. The transition to Paradox is easier because the current version of Access has undergone a language change, while the Paradox language hasn't changed in the 32-bit version.

Desktop databases

But some who prefer Paradox to Access said, nonetheless, that Microsoft has irreversibly captured the market. "As good as Paradox 7 is, it might be difficult to sustain applications written in it [if the number of developers drops in the future]. It's tough to find a Paradox developer these days. Many of them have moved to Access, PowerBuilder or Delphi development," said Frank Andersen, a systems analyst at Peter Pan Seafoods, Inc. in Seattle and a Paradox 7 beta tester.

However, some beta testers said finding Paradox developers depends on where you are.

"Seattle is a tough spot for anybody who's not Microsoft," said Charlie Russel, systems administrator at New United Motor Manufacturing, Inc., a General Motors/Toyota joint venture in Fremont, Calif. "I have no trouble finding Paradox developers here."

Borland has established a loyal base of Paradox developers since it released the product in

Paradox vs. Access

FUNCTION	PARADOX 7	ACCESS 7
Compatibility with previous Windows 3.x version	Full	Limited
Native links included	Microsoft's SQL Server, ODBC, Oracle, Sybase, Interbase	Microsoft's SQL Server, ODBC
Integration with suites	Microsoft's Office, Novell's PerfectOffice	Microsoft's Office

1985. And the Borland developer community has continued to grow, said Richard Gorman, vice president of Borland product marketing and management. Attendance at the Borland developer conference in San Diego in August — 2,200 developers — was up 30% from 1994, he said.

Nonetheless, one analyst said times could be tough for Borland. "It'll be hard for a stand-alone database to beat a database bundled in a suite as successful as Microsoft's," said Chris Le Toq, principal at Sof-Tracks Software Research in Los Altos, Calif.

"Access is kicking serious

but in the desktop database market. It has grabbed the focus away from Borland. Paradox has to grab attention [back] by delivering differentiated features and distinguishing itself as more geared to the developer community," Le Toq said.

However, when Paradox 7 arrives in PerfectOffice 7 for Windows 95, the database will finally compete with Access on a level playing field. But the delay of PerfectOffice 7 until the first quarter of 1996 could delay that competition.

& DB2 is going client/server, or so IBM says. See page 61.

The difference a year makes

Laptop sales to overcome slump and hit record high in 1996

By Mindy Blodgett

Despite a slowdown in the pace of laptop shipments, analysts expect explosive growth in the sector next year as more users turn to notebooks as their primary computer and vendors make Pentium chips standard in the mobile units.

Demand is also expected to climb as high-end features trickle down into the value end of the market. That could push laptop growth to the highest numbers in the past couple of years, analysts said, though they declined to name specifics.

But in the meantime, recent numbers indicate that laptop shipment growth is surprisingly sluggish, especially when compared with periods earlier this year and last year.

"But once we are over this hump, we just expect outrageous growth," said Kimball Brown, an analyst at Dataquest, Inc. in San Jose, Calif.

Dataquest predicts that laptop shipments will grow just 25% this year, compared with 41% in 1994.

International Data Corp. in

Framingham, Mass., predicted that this year's overall growth will be about 24%, down from an earlier estimate of 29%.

Manufacturers said demand for laptops with Intel Corp. Pentium chips is not the problem. Indeed, users are clamoring for machines based on the faster chip.

Demand is there

Kevin Daney, manager of workgroup applications development at Millipore Corp. in Bedford, Mass., said he will soon recommend that his company buy new Pentium-based computers for a few hundred users.

"We are definitely moving into Pentiums. That is the way to go," he said. "But we are waiting to see prices go down. Now we know how Intel works, that they space their chip announcements and their prices go down. We're waiting until the first or second quarter next year."

Much of the softening in the growth rate is due to the engineering difficulties inherent in installing the faster Pentium chips into portables, industry observers said. The faster chip

creates problems — with heat dissipation, for example. The 120-MHz Pentium was delayed by about a month due to a minor design flaw [CW, Sept. 11].

Heddy Baker, a spokeswoman for Compaq Computer Corp., said there have been complica-

tions in redesigning the laptops to include the Pentium chips.

Robert Stephenson, senior vice president and group executive at the IBM PC Co., said technical difficulties in implementing the new chips have slowed IBM notebook shipments.

Tom Scott, general manager at Toshiba America Information Systems, Inc., called the demand for Pentium laptops "insatiable." He said that since his

company has been working with Intel for more than a year on the transition to Pentium chips — and was the first notebook manufacturer to start the switch-over — Toshiba has been meeting most of its shipment orders.

Still, Toshiba is having some difficulties meeting demand, he said. The shipment slowdown, coupled with the high demand, is likely to prevent a price war anytime soon.

Toshiba rolls out the notebooks



Key features in Toshiba's new Satellite Pro 420 Series

- 90-MHz Pentium processor; 8M bytes of RAM
- Slots for two Type II PC cards or one Type III card
- 7.1 pounds; with modular CD-ROM drive, weighs 7.4 pounds

Toshiba continued its product rollout last week with a line of Pentium notebooks aimed at the sub-\$5,000 segment of the market.

Although he declined to reveal exact pricing, Len Herbstman, senior product manager for the new Satellite Pro 410 series, said the 410CDT, with an active-matrix color screen, will cost less than \$5,000. The 410CS, with a dual-scan color screen, will cost less than \$4,000.

Pricing will be available in early November, Herbstman said.

Toshiba is waiting to an-

ounce pricing on the Satellite Pro series and the new high-end Tecra 700 notebook series "because we wanted to see where our competitors are putting pricing," said Tom Scott, general manager at Toshiba.

Toshiba's new Satellite Pro models have a 11.3-in. screen, a 90-MHz Pentium processor, support for two Type II PC cards or one Type III PC card, a removable floppy disk drive and CD-ROM module and 8M bytes of RAM.

The new systems will ship in November.

—Mindy Blodgett

News

FCC to keep tight rein on frame-relay pricing

But cost to users likely to remain about the same

By Neal Weinberg

If you're considering frame-relay service for sending data across a wide-area network and you're hoping rates will drop when the telecommunications carriers file formal rates with the Federal Communications Commission later this year, don't hold your breath.

If you are a large user adept at power negotiations, now is the time to ink a deal for frame-relay service. But don't forget a clause that lets you renegotiate in the off chance the new rates are lower.

And if you are a smaller company just window-shopping, it may make sense to wait for the new rates to come out so it will be easier to compare prices.

Those are the recommendations of telecommunications analysts who are trying to predict the effects of the FCC's

N.J., said there is more to a frame-relay contract than price. Carriers offer managed services that include value-added features such as network management, service and repair.

"Price is very important, but it's not necessarily the only or most important factor," Smith said.

The FCC ruled that frame relay, which breaks up transmissions into discrete packets, is a basic data transport service rather than an enhanced service, and is

thus subject to tariff regulation.

The FCC also said the carriers must unbundle frame-relay service from frame-relay equipment.

Q **OLAP** might not need multidimensional databases anymore. See page 61.

Buyer beware

What to look for in the fine print when purchasing frame-relay service

- Make sure the frame burst size is appropriate for your needs
- Check the frame discard rate to ensure essential data is not lost
- Be sure the frame delay rate is adequate in case of congestion

recent ruling that carriers must file formal frame-relay rates in the next 60 days.

Currently, frame-relay service, unlike long-distance service, is unregulated. Carriers voluntarily publish list prices that are mere jumping-off points for hammering out customized contracts, according to Rick Malone, an analyst at Vertical Systems Group in Dedham, Mass.

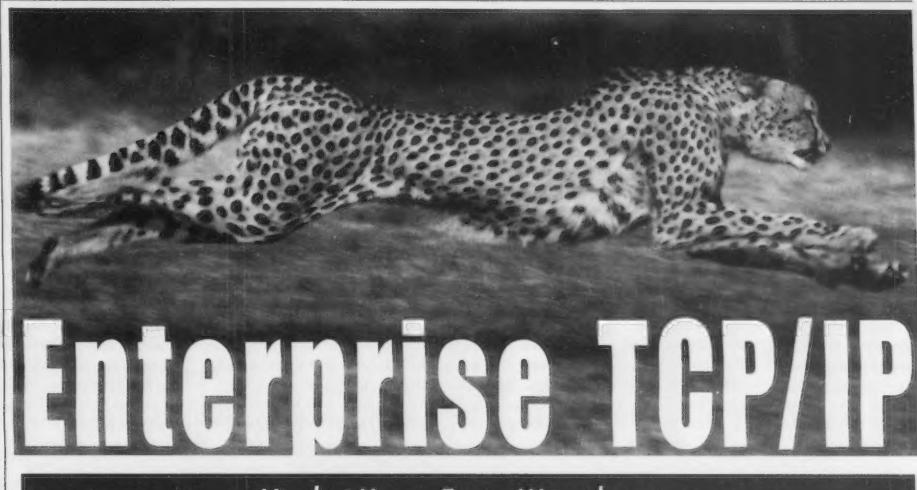
When the formal tariffs are approved by the FCC, AT&T Corp., MCI Communications Corp., Sprint Corp. and other frame-relay providers will have little price flexibility, said Tom Nolle, an analyst at the CIMI Corp. in Voorhees, N.J.

Analysts agreed that actual prices will remain about the same. Carriers will honor current contracts and will not want to rock the boat by offering new customers better deals.

The plus side of the FCC ruling is that "it's always nice to have a level field where you don't have to be a power negotiator to get frame relay," said Tim Burke, an analyst at The Yankee Group in Boston. The downside is an additional layer of government regulation, he said.

Nolle pointed out that unless the FCC requires the carriers to file detailed rate structures that are conducive to apples-to-apples comparisons, consumers won't benefit much.

And Mike Smith, an analyst at Datapro Information Services Group in Delran,



Enterprise TCP/IP

*MultiNet For Windows.
Powerful. Reliable. Sleek. Fast.*



TGV's MultiNet® is the only TCP/IP solution to deliver the performance, reliability, and ease of use that corporate networks demand.

MultiNet is first to let you run Microsoft Windows for Workgroups networking over a superior TCP/IP stack. It is the first to let you select and pay for just the TCP/IP applications you need, thereby reducing software and support costs. And MultiNet is first with supernet support so that IP address limitations are no longer an administrative nightmare.



"MultiNet establishes new benchmarks for speed, compatibility and range of services."
David Shute, Internet Publishing Consultant,
The Facilitators, Inc.

MultiNet for Windows TCP/IP Stack & Applications

TCP/IP Stack
32-bit VxD
DHCP and Bootp
NetBIOS/NDI interface
RIP & Router Discovery
Supernet support
Multicast
Ethernet, Token-Ring
PPP and SLIP/CSLP

NEW VERSION

File Sharing
FTP client and server
32-bit VxD NFS client

Terminal Emulation
Telnet and Rlogin
VT220 and TN3270
Kerberos authentication

Internet Applications
Enhanced Mosaic V2.1
Pronto Mail V2.0

Network Printing
LPR
PCNFS
Stream (reverse Telnet)

Network Utilities
Ping
Traceroute
Host lookup
Whois
Finger

What's more, MultiNet really simplifies

IP address configuration with DHCP and Bootp. And MultiNet's dynamic routing simplifies the most complex corporate internet.

Plus all of these benefits are included in MultiNet for OpenVMS as well.

Get MultiNet up and running on your enterprise network today. It's powerful. Reliable. Sleek. Fast. And designed for the enterprise.

To Order Your Free Evaluation Software:
Call 800-TGV-3440 or 408-457-5200



The Enterprise TCP/IP Experts

Fax: 408-457-5205 Email: sales@tgv.com Web Server: <http://www.tgv.com> TGV Europe Tel: +44-1-256-8141511
*Developer tested only. Novell makes no warranty with respect to this product. MultiNet is a registered trademark of TGV Software, Inc. All other trademarks are the property of their respective owners. ©1995 TGV Software, Inc. 016

News

Warehousing

CONTINUED FROM PAGE 1

By using an internal World Wide Web architecture rather than a traditional LAN, the company has avoided having to write client programs for each of its PC and Macintosh user groups. Instead, Web browsers from Netscape Communications Corp. provide a consistent, cross-platform interface for the 175 to 200 users who will access the warehouse by the end of next year.

An internal Web application runs over the Internet infrastructure but resides behind a company's own security layers, which protect it from random 'net surfers.

The goal of Cracker Barrel's project is to give users companywide access to daily, weekly and monthly

ly sales data sent from 200 restaurants to the company's IBM AS/400 minicomputers and then copied to Microsoft Corp.'s Windows NT-based Web server.

The company plans to outfit an early wave of 20 to 30 power users with the sales analysis application in November.

"We knew that we wanted to get into warehousing to get a handle on sales trends and the like," said Joe Baltimore, a senior network engineer at Cracker Barrel. "And then we discovered this Web stuff."

In early August, 11 designers, developers and network engi-

neers were assigned to the project, which came in 45 days later and cost less than \$10,000, Baltimore said.

The addition of NT to the mix was critical, Baltimore said, because of a lack of Internet software for AS/400s. He chose Framingham, Mass.-based Pro-

cess Software Corp.'s Purveyor Web server.

Yet pioneering as complex a Web application as data warehousing has its headaches, Baltimore said.

For example, four database designers and developers at Cracker Barrel had to manually write scripts to get the firm's AS/400 database to converse with the NT-based Web server.

But most ticklish, Baltimore said, was figuring out how to automatically update information residing at the Web server when corresponding data on the AS/400 was changed.

For that, programmers wrote complicated triggers with a combination of Microsoft's Visual Basic and the C language. An "overseer" table watches for changes and nudges triggers into action when data updates are required on the Web server.

Another problem that Baltimore said he hopes a maturing market will address is that true analysis capabilities are limited for users who grab data with a Web browser.

"Netscape lets us get a good view of the information, but if we



MATTHEW DAVIS

Cracker Barrel's Joe Baltimore: "We knew that we wanted to get into warehousing to get a handle on sales trends and the like. And then we discovered this Web stuff."

ers, simple access to the data "is good enough for now," he said.

Several major newspapers team up to offer help wanted ads on the Web. See page 54.

Users to Tandem: Slow down!

CONTINUED FROM PAGE 1

ing system every six months is "a little aggressive but not unheard of" in the computer industry, said Jim Johnson, chairman of the Standish Group International, Inc. in Dennis, Mass.

Johnson said Tandem's response to users' complaints — providing a menu of new fea-

tures and bug fixes — sounded unique.

According to Lawler, a technical consultant at CrestCo Ltd., a financial information systems firm that tracks London Stock Exchange trades, some Tandem users who ignore new operating system releases risk losing support services because Tandem provides prompt help-line assistance for only "the last two or

three releases." Users on older versions have to wait for help, he said.

In agreement

Other users echoed some of Lawler's concerns.

Giancarlo Scaini, systems manager at Societa Per I Servizi Bancari (Society for Banking Services) in Milan, Italy, said Tandem's release practices create a problem for his company, which administers consumers' debit-card transactions for

Italian banks.

"So many releases in such a short time — it's in conflict with continuous availability," Scaini said. "We would have to bring a system down to test [new software]. It's important that we have continuous availability."

Mark Pleticha, manager of Tandem systems support at Wells Fargo Bank in San Francisco, said Tandem users have seen a drop-off in support since 1993, when the company started emphasizing telephone assis-

tance instead of site visits by systems experts. Tandem previously had more staff who could visit user sites and deliver support, Pleticha said.

Wilson said the Tandem National Support Center is ready to provide quick assistance on the most recent versions of the NonStop Kernel operating system, such as the D series and most of the C series that preceded it. Wilson said the company will provide special support contracts for users on older versions of the operating system.

The new process, to be implemented in the coming months, will be up and running by next fall's ITUG conference, Wilson said. "It allows people to choose what fixes they need and the new features they need," he said.

"I think [Lawler] is describing the feelings that an under-staffed operations outfit might feel. As Tandem brings out major functionality releases every six months, it is difficult to keep up with the change. But that will only accelerate as Tandem continues to move toward open systems" products, said Philip Landau-Smith, a database middleware developer at ITI, Inc. in Paoli, Pa.

Tandem's quarter off; Treybig steps down

Shrinking profit margins and disappointing fiscal 1995 profits prompted a top-level management shake-up at Tandem last week, including the replacement of founder James Treybig as president and chief executive officer.

Tandem said it earned \$19.8 million on \$640 million in sales for its fourth quarter compared with net income of \$71 million on \$604 million in sales for the same period a year ago. Earnings for fiscal 1995 were \$107.5 million, down from last year's profits of \$170 million.

That hurt

The company cited the delayed introduction of its Unix-based Integrity servers that hurt quarterly sales to telecommunications customers, a key Tandem market.

The company also realized lower-than-forecast revenue for its product line. And Tandem's networking products subsidiary, UB Networks, suffered declining sales, the company said.

Treybig announced he is ending his 20-year tenure as Tandem's president and will step down after the company names a replacement in the next several months. Once that happens, he will become chairman of the board at Tandem.

In addition, two other top longtime Tandem executives — Chief Operating Officer Robert C. Marshall, a 20-year veteran, and Donald E. Fowler, general manager of the solutions products group and a 10-year veteran — will retire in December, the company said. Thomas J. Perkins, the company's current chairman and an original venture capitalist investor in

Tandem, will remain on the board of directors.

James Johnson, chairman of The Standish Group International, said Tandem has struggled with the problems faced by a proprietary systems vendor trying to move to the open systems products demanded by the marketplace. But Tandem had been sluggish to move, he said.

David Lawler, president of the International Tandem Users Group, said the management changes caught users by surprise. But he added that the moves signify Tandem's commitment to move into a world of open systems.

"People see it as a healthy move. Tandem is well positioned in technology terms, and they see that the significant changes in the sort of senior executives announced will be good for Tandem," Lawler said. "People needed to see they're actually willing to change the culture of the company."

—Michael Goldberg

Tandem bets the future on its ServerNet technology. See page 32.

For Issues This Challenging, There's Only One Answer.

The SAS® System.

DATA WAREHOUSING

SAS Institute is the only software provider of end-to-end data warehousing solutions that enable you to

leverage your investment in existing relational technology. Decision makers can access data from far-flung data repositories, and then transform that data into meaningful information...without dragging down the performance of your operational systems.

EIS

We believe there's more to EIS than fancy front-ends alone. Take advantage of the SAS System's menu-driven, object-oriented, and scalable toolset to build customized enterprise information systems that tap directly into your vast information reservoir...and that make full use of the latest reporting and graphical capabilities.

Knowledge workers need access to relevant data in a timely fashion.

On-Line Analytical Processing with the SAS System is ideal for putting decision makers

in touch with the data they need... and for slicing and dicing that data to identify trends and exceptions.

OLAP



President and CEO James H. Goodnight



SAS Institute Inc.
Phone 919-677-8200
Fax 919-677-4444
URL: <http://www.sas.com/>
In Canada: 1-800-363-8397

SAS is a registered trademark of SAS Institute Inc.
Copyright © 1995 by SAS Institute Inc.



To receive a SAS System Executive Summary, give us a call or send us E-mail at cw@sas.sas.com

Think Compaq can beat
HP PCs
for network-ready features and prices?
Prepare to have that idea
shattered.

You should ask what Compaq means by 'network-ready.' For instance, are their PC's easiest to set up in multivendor networks? Is their management solution industry-standard - and can it manage all brands of PCs, not just their own?

Are all management features available under

from
\$1,639*

Windows 3.1? Are they free?

In HP's case, the answers are all yes.

In addition, HP ranked best overall among desktop personal PC users in the 1994 J.D. Power and Associates Customer Satisfaction Study.¹

So call 1-800-322-HPPC, Ext. 9396,[†] for more information and the name of your nearest HP dealer. We're more network-ready than anyone.



**HEWLETT[®]
PACKARD**

*Average U.S. street price for Pentium® processor-based HP Vectra XM3 5/75 PC (pn D3481A). Monitor not included. All HP Vectra PCs come with MS-DOS® 6.2 and MS Windows for Workgroups 3.11 preinstalled. U.S. registered trademark and Windows is a U.S. trademark of Microsoft Corporation. Pentium and the Intel Inside logo are U.S. registered trademarks of Intel Corporation. ¹In Canada, call 1-800-387-3867.



HP mouse and keyboard. ¹Source 1994 J.D. Power and Associates PC Customer Satisfaction Study.SM Study conducted among business users and based on 1,528 user respondents. MS-DOS is a
©1995 Hewlett-Packard Company PPG423



pentium

Oracle Web package raises Internet ante

WebSystem could replace network software at user sites

By Dan Richman
BOSTON

Oracle Corp. is expected to raise the stakes here today in the Internet game

with the debut of a free World Wide Web browser and software that adapts its relational database management system to Internet use.

Analysts and users said the products

in Oracle's WebSystem suite, and similar products from competing vendors, are significant enough to herald a major change in client/server computing.

That change will be the shift toward using the Internet instead of conventional networking software, which may culmi-

nate in the replacement of PCs with inexpensive, simple Internet-access devices.

Oracle's PowerBrowser, formerly known as WebStation, will lead the way to more interactive Web sites, users and analysts agreed. Free of charge, it is scheduled for delivery by year's end and appears to exceed the capabilities of market-leading Web browsers from Netscape Communications Corp., NetManage, Inc. and other vendors.

"Oracle has done some very, very cool things here, making the browser able to be a local server and to create a home page on any machine," said Robert Martin, vice president of network programming services for HBO, Inc. in New York.

PowerBrowser has its own Hypertext Transport Protocol (HTTP) server —

software that can host a Web site — allowing any PC

or Macintosh to function as a server and a browser. It can develop applications graphically using the standard Hypertext Markup Language, and it adds Database Markup Language (DBML) for data validation.

DBML is a Basic-based scripting language. PowerBrowser also will run applications written in Sun Microsystems, Inc.'s Java language.

New brew

Oracle plans to announce this week that it will integrate Sun's Java Web development language with Oracle's forthcoming Web servers. Oracle also plans to build Java support into its Unix relational database and several other products next year.

scripting language. PowerBrowser also will run applications written in Sun Microsystems, Inc.'s Java language.

WebServer Option, a second product in the WebSystem suite, allows Oracle's Oracle7 Enterprise Server RDBMS to be used as an HTTP server. WebServer Option is available immediately for Sun's SPARC Solaris. It is promised for Microsoft Corp.'s Windows NT and major Unix platforms by early November. The list price is \$4,995.

The third WebSystem product, WebServer, operates like WebServer Option but includes a copy of Oracle7 Workgroup Server. It is set to ship by the end of November for SPARC Solaris, SCO, Inc.'s Unix and Windows NT. The list price is also \$4,995.

Aron Dutta, a principal at Booz Allen & Hamilton, Inc., a consultancy in New York, said his firm would evaluate the Oracle products.

"If they give us more than Netscape's [products] in terms of interoperability with other vendors, scalability, ease of management, ease of integration and security, we'll think about buying them," he said.

Dutta said he was particularly impressed with the virtues of using the Internet as an intracompany network.

"It is a miracle" how easy it is to develop and distribute secure, reliable, reusable Internet applications, he said.



IT'S NOT HOW MUCH YOU READ.

You can read a knee-high stack of computer magazines each month and still not find the depth and breadth of news and information you'll discover each week in the pages of *Computerworld*.

As the only weekly newspaper for IS professionals, *Computerworld* is filled with up-to-the-minute articles on topics ranging from products and people to trends and technology. We cover it all — PC's, workstations, mainframes, client/server computing, networking, communications, open systems, languages, industry news, and more.

It's everything you need to know to get an edge on the competition.

That's why over 143,000 IS professionals pay to subscribe to *Computerworld*. Shouldn't you?



IT'S WHAT YOU READ.

Order *Computerworld* and you'll receive 51 information-packed issues. Plus, you'll receive our special bonus publication, *The Premier 100*, an annual profile of the leading companies using information systems technology.

Call us toll-free at 1-800-343-6474. Or use the postage-paid subscription card bound into this issue.

And get your own copy of *Computerworld*.

Then you can spend less time reading about the world of information systems.

And more time conquering it.



The Newspaper of IS



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 887 SALINAS CA

POSTAGE WILL BE PAID BY ADDRESSEE

ADobe SYSTEMS FULFILLMENT CENTER
ADobe SYSTEMS INCORPORATED
PO BOX 6458
SALINAS CA 93912-9899



NO POSTAGE
NECESSARY IF
MAILED IN THE
UNITED STATES



TIME TO
TUNE-UP
YOUR
BUSINESS
DOCUMENTS.

Adobe™ Acrobat™ can get your business running better than ever. And we have all the information you'll need to get started. So complete this card and return it today for your *free* Universal Electronic Publishing Kit.

I am interested in Acrobat/Capture™ for:
 Publishing on the Web Document search capabilities
 Collaborative use in workgroups Scanning documents
 To use with Lotus Notes®

Name _____

Title/Occupation _____

Company _____

Address _____

City _____ State _____ Zip _____

Allow 4-6 weeks for delivery. Offer good while supplies last. Offer subject to withdrawal. Adobe, the Adobe logo, Acrobat and Capture are trademarks of Adobe Systems Incorporated or its subsidiaries which may be registered in certain jurisdictions. ©1995 Adobe Systems Incorporated. All rights reserved. K0459C





Solstice lets you control Network without leaving your desk.



Now you can have all the benefits of distributed computing with centralized control. And save huge amounts of administration time and money. Because our Solstice™ AutoClient™ solution eliminates almost all individual desktop administration. And puts desktop management on the server, where it belongs. You load the operating system and software only once, and desktops access it as needed. You maintain and troubleshoot from one location. You eliminate desktop backups and data restoration.

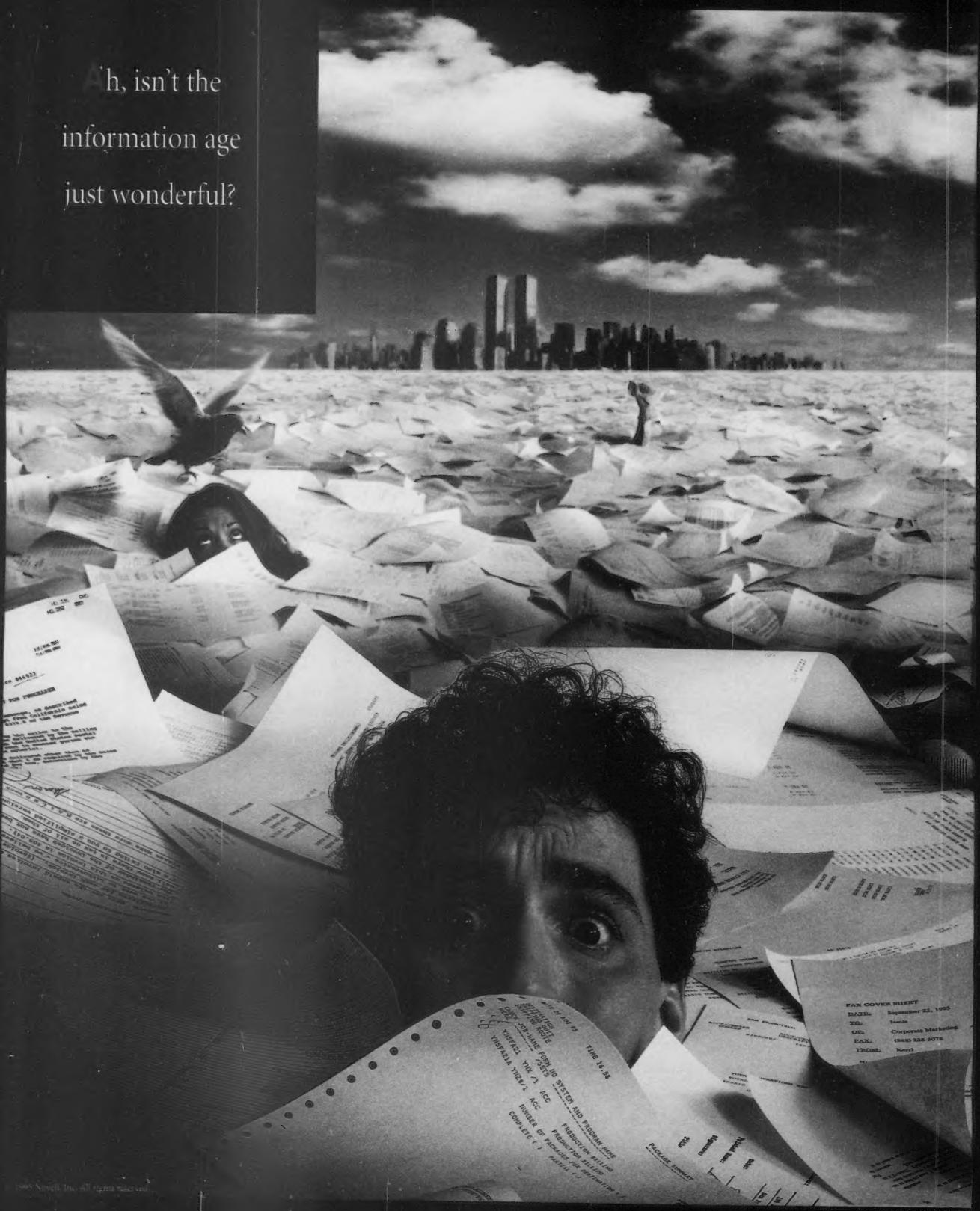
And Solstice AutoClient reduces network traffic so dramatically that each server can handle up to three times more clients.

Without sacrificing desktop performance. To know more, contact us at <http://www.sun.com/> or 1-800-SUNSOFT, prompt #1.



THE NETWORK IS THE COMPUTER™

h, isn't the
information age
just wonderful?



FAX COVER SHEET
DATE: September 22, 1990
TO: Jamie
C/O: Corporate Marketing
FAX: (312) 238-5078
E-MAIL: [\[REDACTED\]](mailto:)

In Dante's *Inferno*, the damned in the seventh circle of Hell must stand neck deep in boiling lava. Not that things are quite that bad in today's business world. At least *you* can get GroupWise™—the groupware solution from Novell. Its Universal In Box helps you control the flood of information by letting you see and manage E-mail, appointments, faxes, even voice mail—all from one place. And with GroupWise you have the option of using a laptop, phone, or pager to retrieve your messages no matter where on earth (or in Hell) you are. So follow the lead of over 5 million users who are already being kept in the loop, and out of limbo. — To learn how other companies are staying on top, check out <http://www.novell.com> on the Internet, or call us at 1-800-778-1851.



NT server routing tool ships

By Bob Wallace

Eicon Technology, Inc. has become the first internetworking vendor to ship a product said to enable Microsoft Corp. Windows NT servers to support the wide-area network routing functions of stand-

alone branch office routers.

With built-in routing, users can cut LAN congestion by going directly to the servers, rather than over LANs, to access files. Built-in routing can save users hundreds of dollars per site by making stand-alone routers unnecessary.

Eicon's product, called WAN Services for Windows NT, comes just months after Compaq Computer Corp. teamed with Cisco Systems, Inc. in a similar effort, but those companies didn't announce a delivery date. Microsoft has also jumped on the bandwagon with plans to build rout-

ing features from Bay Networks, Inc. into its Cairo operating system that will ship in mid-1996.

The Eicon approach differs from Microsoft's project in that Microsoft is building routing directly into the operating system. "This gives you a much tighter coupling than using cards with their own software," said Skip MacAskill, a senior research analyst at Gartner Group, Inc. in Stamford, Conn.

Novell, Inc. became the first major server vendor to build routing into its servers in the early 1990s.

Users said they see benefits besides cost savings by integrating routing capabilities into NT servers.

COMPUTERWORLD's Code of Ethics

1. Computerworld's first priority is the interest of its readers.
2. Editorial decisions are made free of advertisers' influence.
3. We insist on fair, unbiased presentation in all news and articles.
4. No advertising that simulates editorial content will be published.
5. Plagiarism is grounds for dismissal.
6. Computerworld makes prompt, complete corrections of errors.
7. Journalists do not own or trade in computer industry stocks.
8. No secondary employment in the IS industry is permitted.
9. Our commitment to fairness is our defense against slander.
10. All editorial opinions will be clearly labeled as such.

The image shows a portion of a Computerworld magazine cover. The visible headline is 'Reality check' and the sub-headline is 'Full benefit of Plug and Play technology is two years away'. Below this is another headline 'IS taps temp execs'. To the right of the magazine is a bar chart titled 'Remote access market' with the subtitle '(Includes remote office routers, hubs, software and servers as well as communications boards)'. The chart shows projected growth from \$720M in 1994 to \$3.16B* in 1997. The bars are labeled with their respective values: \$720M, \$1.38B*, \$2.28B*, and \$3.16B*.

WORDS WE LIVE BY.

When you pick up a copy of *Computerworld*, you know you're getting the most objective, unbiased news and information in IS. Our code of ethics guarantees it.

Why do we make such a big deal out of editorial integrity?

Because the words you read in *Computerworld* often have a dramatic impact on your business, your career, and your future.

You use this information to evaluate new products. To get a candid view of emerging technologies. To find out the inside story on corporate strategies. To decide whether to jump ship or stay in your current job. To get the edge on your competition.

In short, *Computerworld* is filled with the words IS professionals like you live by.

WORDS YOU WORK BY.

Week in and week out, our editors and reporters call it the way they see it — on issues ranging from network management to reengineering. They dig deeply to bring you the most accurate, comprehensive news in IS.

It's no wonder over 143,000 IS professionals pay to subscribe to *Computerworld*. Shouldn't you? Order today and you'll receive 51 information-packed issues. Plus, you'll get our special bonus publication, *The Premier 100*, an annual profile of the leading companies using IS technology.

Call us toll-free at 1-800-343-6474. Or use the postage-paid subscription card bound into this issue.

You'll get the kind of straightforward, impartial reporting you can work by. You have our word on it.

COMPUTERWORLD

Source: Infonetics Research, Inc., San Jose, Calif.

"This will lessen the load on our LANs by having users directly access applications on the server, which is a big benefit," said Alex Thurber, president of the Thurber Group in Portland, Ore.

Users need to determine if adding router duties onto the server will slow server performance.

"The performance of a combination server/router will be directly related to the architecture of the server," MacAskill said. "If you don't plan to push the server hard as a server, the combo approach can be extremely attractive."

MacAskill added that this approach is appealing if a user wants no-frills routing functionality, but it could present problems if a user adds more and more routing features to the server.

Thurber said he wasn't overly concerned about a potential drop in server performance.

"We'll be able to markedly lessen the congestion on our Ethernet LANs, which we think is worth any potential performance hit," Thurber said. "It's something we'll definitely have to look at once we install the cards."

WAN Services for Windows NT enables the server to support IP routing over frame-relay, leased and X.25 connections. A future release will support Novell's IPX protocol.

The software runs on Eicon cards that work with servers supporting Intel Corp.'s x86 and Pentium, Digital Equipment Corp.'s Alpha, Mips Technologies, Inc.'s chips and the PowerPC.

WAN Services for Windows NT software is priced at \$595, with Intel x86, Pentium and Digital Alpha versions shipping this month. The Mips and PowerPC versions will ship next month.

The software operates with Windows NT 3.51 and runs on the EiconCard family of networking cards, priced from \$1,095 to \$1,495.



TAKE CONTROL
—of—
YOUR NETWORK



LANDesk® Management Suite 2.0 is the first integrated desktop management suite for controlling your network.



From software distribution to metering, its applications are integrated to work together.



Create customized solutions for daily tasks by mixing and matching tools.



Proactive network monitoring alerts you to take corrective action before problems occur.



1-800-538-3373

For more information and a free video or CD-ROM, call ext. 614. Or find us on the Web at <http://www.intel.com/>.

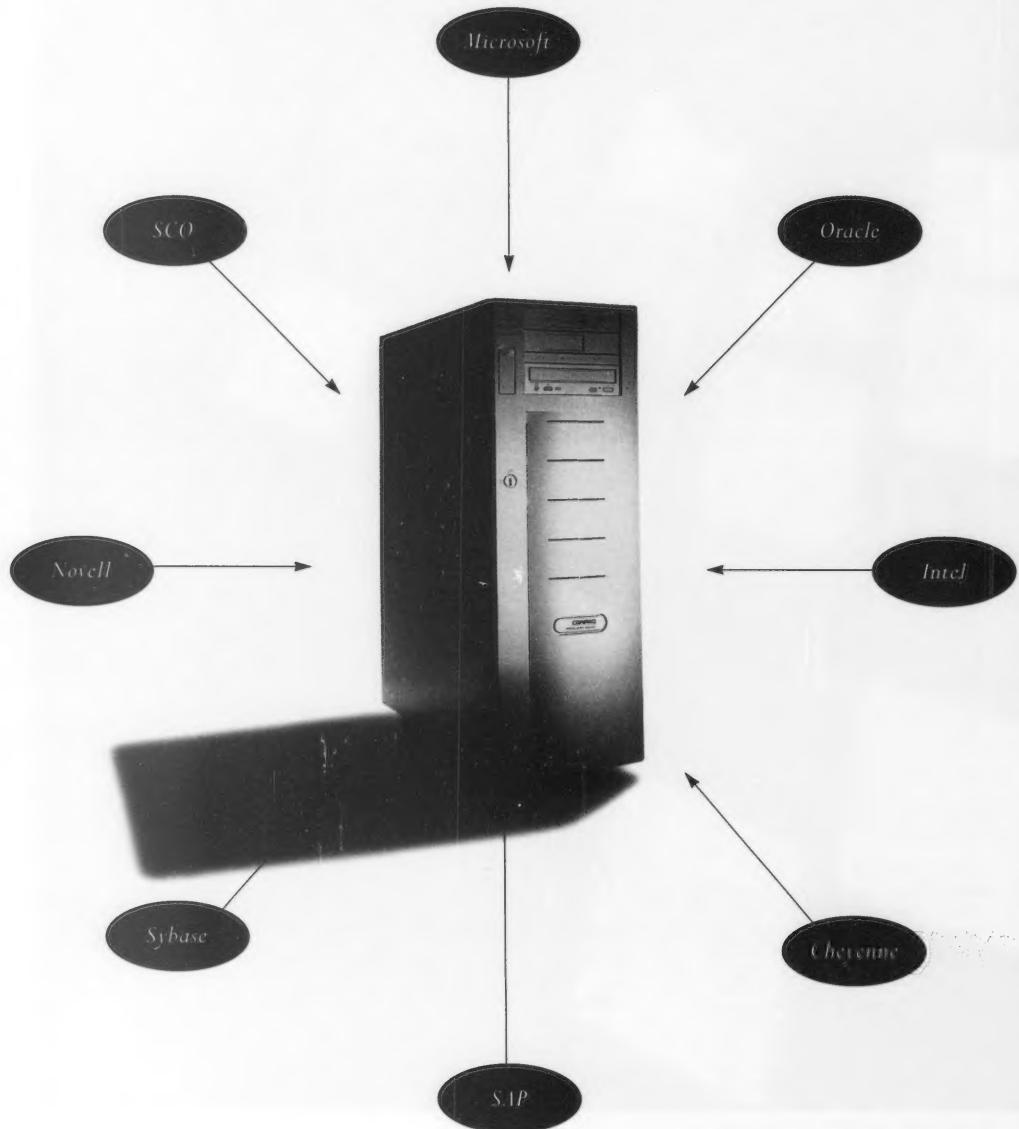
© 1995 Intel Corporation

Integrated network management
in one simple stroke:
LANDesk® Management Suite 2.0.

intel[®]

SERVERS are BUILT by TEAMS of PEOPLE.

SOLU



REASONS TO TRY TIONS are BUILT by TEAMS of COMPANIES.

Any computer company can build hardware that

runs software that runs your business. Or can it?

After all, this is your business we're talking about here. Do you really want to trust it to mere hardware? At Compaq, we're betting you'd prefer an easy-to-use, fully thought-out solution. A solution that is the right combination of server, operating system, and database application that solves the puzzle of your varied computing needs.

Well, that takes several companies. Companies like Microsoft, with whom we created the ideal platform for Windows NT and BackOffice, integrating hardware, software, and server management. Novell, with whom we've created networking standards for years. Oracle, whose databases are far easier to deploy on a Compaq server thanks to our partnership. And SAP, a leader in client/server applications, who's named us Partner of the Year.

You see, they may be Compaq servers. But they are Compaq-Microsoft-Oracle-SAP-Intel-Novell-SCO-Sybase-Cheyenne solutions. (We just couldn't fit all those logos on them.)

COMPAQ

Has It Changed Your Life Yet?

Business execs fault IS info gap

Survey says IS fails to provide accurate cost data, performance measurements

By Mitch Wagner

Computerization continues to fail to provide business executives with the information they need to make important management decisions.

That grim observation came last week from a Price Waterhouse survey conducted among about 200 executives from all areas of business, including marketing, financial functions and information technology.

"It comes down to communication: Are the IS people communicating with the business folks?" said Winthrop Cody, vice president of information systems at Copeland Associates, Inc., an investment company in East Brunswick, N.J.

He and other IS professionals at the annual Society for Information Management conference last week in Orlando, Fla., said the findings struck a familiar and disillusioning chord.

Several said the reason behind the lack of good business information is that IS managers haven't been able to find out

what kinds of information business executives really need.

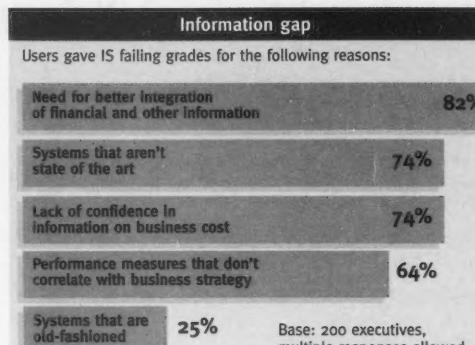
"IS professionals are not marketing and financial professionals," Cody noted. "There have got to be people in those areas that can define their needs."

Only 13% of executives in all business functions said they had good information to anticipate the needs of their markets. The executives surveyed also cast doubt on the accuracy of cost data, integration of financial and other business data, and the extent to which performance measurements are actually tied to business strategies (see chart).

The survey was conducted in conjunction with Lawson Software in Minneapolis. Lawson makes client/server business software.

Separation anxiety

Information technology often fails to provide good business information because IS departments are isolated from the rest of corporate culture, said Brian Coffman, director of the management center for CNL Group,



Base: 200 executives, multiple responses allowed

Inc., a real estate investment firm in Orlando. Coffman, an assistant to CNL Group's chief executive officer, is working as a facilitator between the IS department and other business units in his company.

"Most of the time there is a definite boundary between any business units but especially for IS people," Coffman said. "It's often difficult to communicate outside in a walled-off IS unit," Coffman said.

At CNL Group, the IS department gives some staffers office space in user departments so IS staffers can become immersed in that other department's culture and learn its needs. One staffer, an application developer, even has a desk on wheels so he can move from one department to another as needed.

James Krueger, director of corporate information services at Hydrite Chemical Co. in

Brookfield, Wis., said IS managers must get beyond tending to their systems and talk to business executives to define what the company's needs are.

Krueger said Hydrite is struggling to close the gap between user needs and what IS delivers. "We spend the greatest amount of time at work involving the user, finding out what they need, more than what we spend on technology," he said.

Ask for what you want

Management consultant Dudley Cooke, president of the Executive Insight Group, Inc. in Bryn Mawr, Pa., said the problem with information quality often arises because businesspeople don't ask for the information they need.

"It's easy to say you didn't get the information you want," he said. "But did you ask for it?"

Joseph Felieu, manager of the San Mateo, Calif., IS service center for the U.S. Postal Service, said he found the results of the Price Waterhouse survey disheartening. "It's certainly not a formula for a long career life if your internal client is saying that about you," he said. "That's disillusioning."

'HOT' multimedia software gives users competitive strategy tool

By Tim Ouellette

Don't look now, but your competition may be ready to Crush you.

Crush, a multimedia software offering from Hands on Technology, Inc. (HOT), promises to help companies develop marketing strategies based on market factors and internal data.

The package lets users segment markets, define trends, prepare competitive positioning maps and create marketing strategy reports. Users enter their own data into various templates and can also import data from databases, spreadsheets and on-line services to the templates.

Throughout the process, video clips and multimedia case studies can be viewed to provide background information and tips about how to get the most out of the software.

Rick Davis, HOT's marketing director, calls Crush a real-time insight tool because users can update their strategies instantly based on new information. They can still use the multimedia features to get background information and create better presentations.

More important, users can step into their competitors' shoes and look at their own strategy.

Crush is one of the first multimedia titles to target business users instead of consumers. To make updating the video clips and adding new data sets easier, the application part of Crush is loaded onto a user's PC, while the multimedia content remains on the CD-ROM.

Crushed

The marketing philosophy and tutorial video clips in Crush come from HOT Chairman Regis McKenna, a marketing analyst who has high-tech experience with Intel Corp. and Apple Computer, Inc.

The strategy of targeting business users may be a wise move if Burlingame, Calif.-based HOT's claims — that the \$499 package has \$1 million in product orders already — are true.

But don't believe the multimedia hype just yet.

"It is a good start, but it has a ways to go," said Scott Nelson, research director for marketing tools and analysis at Gartner Group, Inc. in Stamford, Conn. He said the user interface can be confusing, and the inclusion of a proprietary database format can limit some use of

the product more useful. These include providing customized data sets for different markets, which can be obtained by downloading from HOT's World Wide Web site (<http://www.hot.sfc.ca.us>) or adding a planned metrics module.

"There are still no real shortcuts to going through and thinking hard about your marketing situation; it doesn't really come through with a silver bullet," said Stephen Barrager, an analyst and beta user at Strategic Decisions Group, a management consulting firm in Menlo Park, Calif.

But Barrager was positive about having a mix of video

the plan results.

He ticked off a number of features that he said would make



Crush's multimedia display makes it easy for users to highlight market trends in a number of categories that affect their businesses

THREE GREAT REASONS TO TRY THREE GREAT PRODUCTS.

1

MIGRATING FROM ANALOG TO DIGITAL



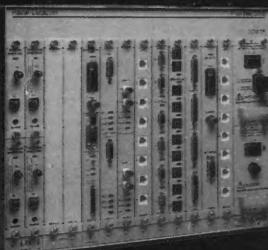
EXCALIBUR® DAPs®

Excalibur Digital Access Products and DSUs come to you from the industry leader—Racal-Datacom. Whether your needs are fundamental business networking or high capacity mission-critical applications, Racal has a solution that works for you today, at your pace and prepares you for

the evolution to frame relay when you're ready.

2

TRANSPORTING DATA, VOICE, ATM AND VIDEO OVER FIBER



PREMNET®

Finally, a high speed solution for transporting multiple data, ATM, voice and video traffic safely and efficiently. With the PremNet fiber backbone from Racal, you can transparently send data in virtually any format at native speeds without the need to create

separate networks for each application type.

3

BUILDING BANDWIDTH TO 1.544 Mbps ACROSS YOUR WAN



ISX 5300

The ISX 5300 is the digital access multiplexer of choice for building bandwidth across your wide area network. Designed to grow with your business, the ISX 5300 effortlessly supports migration to frame relay, fractional T-1, T-1 and ATM when you're ready.

4 REASON NUMBER FOUR

More than ever, your business depends on your network. For that reason, shouldn't you depend on a company that understands the importance of network communications? Since 1955 Racal-Datacom has helped the world's business and government organizations migrate mission-critical applications to new technologies and services. That's why all Racal products are supported by the company's strength in network management and expertise in managed migration services including network design, implementation, worldwide maintenance and support.

You can use any or all of these reasons to give us a call. Ask about our special promotions on Excalibur, PremNet and ISX 5300 products. For a limited time, we're offering free network management software, free installation with your maintenance purchase and free design services on select products.*

When it comes to managed migration, Racal has a solution. That's reason enough to call us today! 1-800-RACAL-55. Or visit us on the Internet at the Racal-Datacom Home Page, <http://www.racal.com>.

THREE GREAT REASONS TO CALL

FREE LITERATURE

All you need to know about Excalibur® DAPs, ISX 5300 multiplexers and PremNet® fiber backbones.

FREE INSTALLATION

Find out how to get free installation on your ISX 5300 with your maintenance purchase.

FREE NETWORK MANAGEMENT SOFTWARE

Check out our free CMS® 400 software offer with the purchase of DAPs or ISX 5300s.

* Limited time offers expire December 31, 1995. Offers are subject to change without notice. Racal-Datacom is a registered trademark of Racal Electronics Plc. Excalibur and PremNet are registered trademarks of Racal-Datacom, Inc. ©1995 Racal-Datacom, Inc. All rights reserved.

RACAL
Communicating through technology

*A few unprovoked remarks about UNIFACE application-building
strongware from Reggy "Chainsaw" Morgan, social secretary
of Client/Server Angels International, West Covina Chapter.*



Compuware and UNIFACE are
registered trademarks of Compuware Corporation
© 1995 Compuware Corporation

THREE GREAT REASONS TO MAIL THIS CARD TODAY!

1 FREE Literature

All you need to know about Excalibur® DAPs, ISX 5300 multiplexers and PremNet® fiber backbones.

2 FREE Installation

Find out how to get free installation on your ISX 5300 with your maintenance purchase.

3 FREE network management software

Check out our free CMS® 400 software offer with the purchase of DAPs or ISX 5300s.

Yes! Please send me information on:

DAPs PremNet ISX 5300

Phone: 1-800-RACAL-55

Home Page: <http://www.racal.com>

CW 10/30/95

Complete reverse side of card with your company name, address and telephone number today!

Racal-Dascom is a registered trademark of Racal Electronics Plc. Excalibur, CMS and PremNet are registered trademarks of Racal-Dascom, Inc. © 1995 Racal-Dascom, Inc. All rights reserved. Offer Expires December 31, 1995. Offer subject to change without notification.

RACAL

Communicating through technology

Name/Title
Phone _____ Ext. _____
FAX _____
Company _____
Address _____
City _____ State _____ Zip _____



NO POSTAGE
NECESSARY
IF MAILED
IN U.S.A.

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 4343, AUSTIN, TX

Postage Will Be Paid By Addressee

Racal-Datacom

P.O. Box 202230
Austin, TX 78720-9899





COMPUWARE.
Uncomplicating Your Life

"Anybody who don't know
that **UNIFACE** strongware is the real stuff
for real systems don't know diddy,
if you get my drift. It kicks butt outta
all that wimpy stuff you read about
and it's built for the long haul. Let
me put it another way. If any of
you heavy breathers haven't gotten the
word about **UNIFACE** yet, let me urge
you to call 800 365-3608 or I might
have to introduce you to my
big brother Waldo.
He's a real salesman,
that guy."

UNIFACE



WHAT THE BIG GUYS USE

For a t-shirt like Reggie's
(smaller logo) and a UNIFACE
brochure, fax your business
card to 810-737-7119, or call
us at 800-365-3608. You can
even catch us
on the Web at
<http://www.compuware.com>
if that's your
modus operandi.



UNIFACE APPLICATION DEVELOPMENT STRONGWARE

Computer Industry

Briefs

DEC quarter up

Digital Equipment Corp. last week reported \$48 million in first-quarter profits on \$3.27 billion in sales for its fourth consecutive profitable quarter. The Maynard, Mass.-based firm lost \$131 million on \$3.12 billion in sales during the same quarter last year.

Netscape profits

Netscape Communications Corp. last week reported a \$1.4 million profit for its fiscal third quarter, logging its first quarterly profit in its 18-month history. The Mountain View, Calif.-based firm posted a loss of \$1.6 million for the same period last year.

Unisys posts loss

Unisys Corp. reported a \$32.2 million third-quarter loss last week. It earned \$30.8 million in last year's third quarter on revenue of \$1.48 billion. Revenue declined to \$1.46 billion in this year's third quarter.

AMD to bolster Intel defenses

NexGen gives clone maker needed ammo

By Jaikumar Vijayan

It seems like Intel Corp.'s aggressive dominance of the chip industry is driving at least one pair of rivals into each other's arms.

Advanced Micro Devices, Inc., the largest manufacturer of Intel chip clones, last week announced it will acquire tiny rival NexGen, Inc. in a move aimed at bolstering AMD's competitive position against Intel.

"[The acquisition] puts AMD back in the race," said Tony Massimini, an analyst at Semico Research Corp. in Phoenix. The result could be more low-cost alternatives to Pentium and Pentium Pro-class systems by late next year, observers said.

Cherished chip

The \$860 million acquisition will give AMD instant access to NexGen's recently announced Nx866, its sixth-generation processor technology. The Nx866 reportedly may rival Intel's next-generation Pentium Pro.

The move eliminates any need for AMD to continue with

its own straggling sixth-generation project that targets the Pentium Pro. The company is seriously behind in its plans to launch even a fifth-generation Pentium rival; the delay was expected to have a domino effect on the sixth-generation project.

AMD said it will drop the latter project immediately. Instead, it will bring to market NexGen's Nx866, now called K6.

Some in the industry also see the merger as a tacit admission of AMD's continued inability to clone Intel chips without using Intel copyrights.

AMD's K5 chip represents the company's first original clone design, but continued compatibility problems with standard x86 software have already pushed launch of the chip well past its mid-1995 schedule. NexGen announced its first Pentium clone late last year, while Cyrix Corp. unwrapped its version earlier this month.

Still, AMD plans to push ahead with its long-delayed Pentium clone, which it hopes to ship in volume by the third quarter of 1996. NexGen's clones ri-

Dueling dowries

The pending merger of the two chip makers will unite the following strengths:

ADVANCED MICRO DEVICES

- Substantial manufacturing capacity
- Strong marketing and distribution
- Financial strength

NEXGEN

- Advanced chip technology
- Design and development talent

will be merged with AMD's brands. As a result of the merger, the Nx866 chip will be manufactured on a sophisticated 0.35-micron manufacturing process at AMD's new billion-dollar Fab 25 plant in Austin, Texas. "NexGen is a great fit for us. It gives us a very experienced design team; it gives us a very competitive sixth-generation product," said an AMD spokesman.

NexGen, which was the first vendor to announce Pentium clone products last year, also was the first to announce a Pentium Pro-class product this year. The company, however, has been severely hampered by the lack of its own manufacturing capability. It has had to rely on IBM Microelectronics to do its manufacturing.

Despite rounding up more than 100, mostly very small, customers worldwide, fewer than 100,000 of NexGen Pentium clones are estimated to have been sold so far. Intel is estimated to have sold more than 30 million Pentium chips.

& Intel has leg up on rivals and will until the second half of next year. See page 41.

Industry starts to take heed of Tandem's ServerNet

By Michael Goldberg
SANTA CLARA, CALIF.

Since introducing ServerNet systems technology in July, Tandem Computers, Inc. has pledged to make it an industry standard by selling it to other systems makers. And while no one is crowning Tandem as the next rising giant, other industry players are starting to listen.

For example, last month, NEC Technologies, Inc. joined with Tandem to build a fault-tolerant server with ServerNet inside to run on Microsoft Corp.'s Windows NT operating system. The server is due in the middle of next year.

And two weeks ago, Compaq Computer Corp. said it would team with Tandem to produce low-latency clusters of Compaq servers using Peripheral Component Interconnect cards with ServerNet hardware and soft-

ware. Compaq hopes to unveil PC server clusters late next year or early in 1997.

ServerNet, which was designed to be an express train for data that doesn't require CPU processing, has piqued the curiosity of other potential buyers, claimed James Treybig, president and chief executive officer of Tandem.

In one of his last official interviews as CEO here last week, Treybig said the firm will announce another deal, similar to the Compaq one, "with another major company, very shortly." For \$2 billion Tandem — tra-



Tandem's James Treybig says ServerNet will push the company into the retail realm

ditionally an enterprise server maker for financial and telecommunications companies that need fail-safe systems — the Compaq deal means changing from a specialty shop to a mass-market retailer.

"ServerNet puts us in another space in

the industry. The part we're in is a sliver of the market. But with ServerNet, we can be in the whole thing," Treybig said.

Tandem will become a commodity ingredient provider for servers and clusters of computers, reducing the technology's cost as its use widens, Treybig

said. He said he will announce soon the formation of a technology and components unit at Tandem to mass produce ServerNet hardware and software.

Treybig said the Cupertino, Calif.-based company also will introduce five new systems with common hardware: two running on its proprietary NonStop Kernel operating system, two on Unix and one on Windows NT.

Big improvement

IS managers and applications developers gathered at the International Tandem Users Group conference here last week said ServerNet will improve the processing efficiency of new Tandem systems.

Shao Wang, an analyst at Smith Barney Equity Research in New York, said ServerNet is a great product for Tandem.

"It's basically a primary source for revenue growth for

the company," he said. That firms such as NEC Corp. and Compaq have sought to use ServerNet "is an interesting testament to the architecture. Tandem is pursuing this not unlike the way microprocessor companies license [their chips]," Wang said.

George Weiss, an analyst at Gartner Group, Inc. in Stamford, Conn., said that in the wake of Compaq's announcement, ServerNet must be taken seriously.

That is a deal that, with accompanying database management software, could provide a low-cost Windows NT alternative to traditional midrange Unix vendors such as Hewlett-Packard Co., Sun Microsystems, Inc., Sequent Computer Corp. and Digital Equipment Corp.

& Windows NT is working to scale up. See page 45.

First you opened your computer system.

Now open the throttle.

one storage

You've invested millions in open systems. From high-performance servers to the latest in application software. But what's the point if your data is slowed to a crawl by a bottleneck of a storage system?

Enter Symmetrix® 3000 ICDA®. Storage that pushes vital applications like OLTP, decision support and data warehousing to their mind-boggling limits.

Put simply, Symmetrix 3000 is in a class by itself. From one central location, it boosts data throughput, reduces response time, offloads CPU processing and lets you access

critical information faster than you've ever dreamed.

Plus, Symmetrix 3000 gives



Introducing the world's fastest open storage. Symmetrix 3000.

you unprecedented connectivity. So whether you're connecting to one server or to many, you can manage

over a terabyte of information with a single Symmetrix 3000.



What's more, it delivers the high availability required by mission-critical applications and uses the same Integrated Cached Disk Array (ICDA) technology proven in thousands of mainframe sites around the world.

To learn more about the only storage system in the world that truly opens your open systems, and how it can make your business more competitive, please call us at 1-800-424-EMC2 ext. 403.

OPEN SYSTEMS ARE MAXIMIZED BY A FACTOR OF EMC²
THE STORAGE ARCHITECTS

**HOW TO
SAVE
\$3000 ON
A \$2500
DESKTOP.**

**TOTAL
LIFECYCLE
SAVINGS:
\$3137**

DELL UltraScan

OptiPlex

DELL

DELL OPTIPLEX

Higher Networked Performance Lower Lifecycle Costs

TOP-TECH
SAVINGS:
\$720

ON THE DESK SAVINGS: \$17.95

OFF THE DESK SAVINGS: \$877*



DELL® OPTIPLEX™ GX 590L

- 16MB RAM/540MB HDD
- 15TE Monitor (15" CRT, .28mm)
- Integrated 3Com Etherlink III
- Integrated Audio
- 3 Year Warranty⁴

\$2480 Product Code: 300824
†Introductory promotional price.

How much do you sink into a PC over the course of its lifetime? Probably several times what you paid for it in the first place.

Dell OptiPlex is designed to help keep PC lifecycle costs under control from acquisition to disposal. For a typical Fortune 500 company who buys 2,500 new PCs every year, the savings could add up to \$3,000 per system over the average 5-year lifecycle of a Dell OptiPlex PC.

How do we do it?

Well, for starters, the price of a Dell OptiPlex is an average of \$348 lower on typical configurations* than other Tier I PC company prices.

And because we build all systems to order, we offer One-Step Factory Integration of software applications and network interface cards in our ISO-9002 certified factories for a flat fee of \$15 per system. Which is more than \$60 off the average installation fee you'd pay elsewhere.

And then there's our Integrated Technology Transition Program. From special financing alternatives to Fair

Market Value Asset Recovery, you could save \$677 on every new OptiPlex.

Okay, so that's \$1086 per system.
Where's the other \$1914?

It's in the day-to-day costs of maintaining a PC that add up over its lifetime. Like reduced downtime. According to *PC Magazine*, Dell's average downtime is 30% below the industry average — and 10% below the average downtime of other Tier 1 companies. And we offer lower NOS support costs than the industry average, consistent, industry-standard component and installation assistance; to name just a few of the ways Dell could further reduce your PC lifecycle costs.

Of course, every company's costs are different. So if you spend more than \$5 million per year on PC purchases, give us a call. Using our Desktop Lifecycle Cost Reduction Model, we'll work with you to evaluate your installed base and purchase plans. We've saved our top customers millions of dollars in lifecycle costs. Let us show you how much you could save with the Dell OptiFlex PC.



(800) 847-4080

<http://www.us.dell.com>

Keycode #12070

Viewpoint

Blind worship?

Someone here in the office recently asked me why we didn't play the story of Jim Manzi's exit from IBM/Lotus on page 1 instead of page 6.

I said one had to read only the first few paragraphs of the story, where our reporter noted that big Lotus customers were quite indifferent about Manzi's leaving. Our own poll of big Notes customers showed conclusively that what users will or won't do with Notes' deployments will be affected little, if at all, by Manzi's departure.

Coincident with the news of Manzi's resignation, attention turned to Ray Ozzie, the chief Notes engineer who industry pundits and the press have linked to the success or failure of Notes. Will Ray leave IBM/Lotus once his commitment to bringing out the next rev of Notes is complete? Isn't Ozzie the guy that Bill Gates labeled as one of the five top something-or-others in the world?

Who cares? The media and the industry pundits, that's who. This industry, in its passion for hero-worship, has formed mantles of invincibility around certain individuals, mantles that don't match the real importance of these people to vendors and the products they produce.

Lotus for years has said its future has been staked unquestionably on Notes. Do you think for one minute that the board of directors of a billion-dollar company (bought this summer by IBM for \$3 billion) would bet its future on one individual, a person who could walk out the door and be killed by a drunk driver?

Idolatry has deep roots in this industry. Years ago, it was assumed that the departure of Gene Amdahl, the creator of the 370 architecture, would sound the death knell for IBM's large systems business. Sure it did. A few years later when Gordon Bell, the father of the PDP-11 and VAX computers, left Digital, the same dirge was played. That was just before Digital mounted the most impressive growth record in its corporate history.

I'm not trying to take anything away from the people mentioned here; each is extraordinarily gifted. But their importance to their companies has to be kept in perspective. At times the racket made by analysts and, regrettably, by the media makes that a difficult task.

Bill Laberis

Bill Laberis, *Editor in Chief*
Internet: bill_laberis@cw.com



Manning Web isn't as easy as it looks

I don't completely agree with your "Web wise" article [CW, Oct. 2]. Hypertext Markup Language (HTML) generators will no doubt be added to every word processing program, but there will always be a place for programmers who can design a Web page.

Web pages can be interactive, for example, allowing a user to enter information to generate a query and return a document with useful information. This type of interactivity will take someone with programming knowledge on many fronts, and an understanding of how to design a Web page that handles forms would be essential.

Things like virtual reality markup language and Sun Microsystems, Inc.'s Hot Java will make designing a Web page a little more complicated than just firing up your word processor and dropping in a few bitmaps to get a decent HTML file.

Ryan Jentzsch
Acordia Personal
Insurance Services
Salt Lake City
ryan_jentzsch@aci.com

Will Microsoft learn from its errs?

"What? Microsoft weak?" [CW, Oct. 2] was a fascinating piece.

Not highlighted in your article, and perhaps not in the book, either, is how Microsoft will cope with failure. Learning is about failing. If you go from success to suc-

cess for years and years, you build up enormous potential for failure.

To use a boxing analogy, how strong a chin does Microsoft have? If the computer industry holds any lesson for us, it is that knockout blows always happen eventually, and occasionally they are self-inflicted.

Digital's knockout blow was denial about Unix. IBM's hubris was pretty much across the whole spectrum. But these blows aren't always terminal. Digital and IBM got up off the canvas to fight again, weaker but perhaps wiser, and each of them with new managers.

Microsoft, at 20 years old, is no longer a spring chicken. I, for one, would pay good money for a ringside seat at the fight of the century between Microsoft and the No. 1 contender, whoever that might be.

Eric Leach
ELM Ltd.
Middlesex, England
100010.3012@compuserve.com

OS/2 overlooked

I was very surprised there was no reference to OS/2 in your article "Intel's P6 chip falls short of expectations" [CW, Sept. 25].

The article says Pentium Pro runs 16-bit applications slowly and Windows 95 users probably wouldn't benefit from it because of the 16-bit code in Windows 95 and limited availability of 32-bit applications. OS/2 is a mature, 32-bit operating system with an abundance of 32-bit software. I expected to see reference to its ability to handle 16-bit Windows applications with this Pentium Pro "problem."

James Veit
Bartlesville, Okla.

OLE omitted

I was surprised that Next's Distributed OLE product wasn't discussed in your article "Object standoff" [CW, Oct. 2] concerning the lack of interoperability among Object Linking and Embedding (OLE) and Common Object Request Broker Architecture (CORBA) objects.

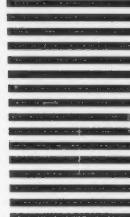
Distributed OLE supports Microsoft's OLE, providing developers with bidirectional distributed communication between Next's OpenStep object model on Windows and Unix and OLE objects. With full CORBA 2.0 support scheduled for next year, Next's Universal ORB will support full interoperability between OpenStep, OLE and CORBA objects, using languages such as Visual Basic, C and C++. This is an important marriage of the major distributed object models and deserved some investigation.

David L. Neumann
2136 South Blvd.
Houston
David_Neumann@NeXT.COM

Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-4144



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-4144



Fill it out. Fax it in. Save \$8. Fax No. (614)382-1058

Yes, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$39.95* per year - a savings of \$8.00 off the basic subscription price.

First Name	MI	Last Name
Title		
Address	City	State
Zip		

Address Shown: Home Business New Renew

Basic Rate: \$48 per year

* U.S. Only. Canada \$95, Mexico, Central/South America \$150, Europe \$295, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

- 10. Manufacturer (other than computer)
- 20. Finance/Insurance/Real Estate
- 30. Medical/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/Transportation
- 70. Manufacturing/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Dist./Retailer
- 95. Other

(Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

- 19. Chief Information Officer/Vice President/ Asst. VP
- 20. IS/MIS/DP Management
- 21. Dir./Mgr.: MIS Services, Information Center
- 22. Dir./Mgr.: Network Sys., Data/Tele. Comm., LAN Mgr., PC Mgr., Tech Planning, Admin Sys.
- 23. Dir./Mgr.: Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
- 41. Engineering, Scientific, R&D, Tech. Mgt.
- 60. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

- 11. President, Owner/Partner, General Mgr.
- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

- 51. Sales & Mktg. Management
- 52. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

- 80. Information Centers/Libraries, Educators, Journalists, Students
- 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems

- (a) Solaris
- (b) Netware
- (c) OS/2
- (d) Unix
- (e) Mac OS
- (f) Windows NT
- (g) Windows
- (h) NeXTstep

App. Development Products

- Yes
- No

Networking Products

- Yes
- No

COMPUTERWORLD

E4K5-9

Fill it out. Fax it in. Save \$8. Fax No. (614)382-1058

Yes, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$39.95* per year - a savings of \$8.00 off the basic subscription price.

First Name	MI	Last Name
Title		
Address	City	State
Zip		

Address Shown: Home Business New Renew

Basic Rate: \$48 per year

* U.S. Only. Canada \$95, Mexico, Central/South America \$150, Europe \$295, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

- 10. Manufacturer (other than computer)
- 20. Finance/Insurance/Real Estate
- 30. Medical/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/Transportation
- 70. Manufacturing/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Dist./Retailer
- 95. Other

(Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

- 19. Chief Information Officer/Vice President/ Asst. VP
- 20. IS/MIS/DP Management
- 21. Dir./Mgr.: MIS Services, Information Center
- 22. Dir./Mgr.: Network Sys., Data/Tele. Comm., LAN Mgr., PC Mgr., Tech Planning, Admin Sys.
- 23. Dir./Mgr.: Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
- 41. Engineering, Scientific, R&D, Tech. Mgt.
- 60. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

- 11. President, Owner/Partner, General Mgr.
- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

- 51. Sales & Mktg. Management
- 52. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

- 80. Information Centers/Libraries, Educators, Journalists, Students
- 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems

- (a) Solaris
- (b) Netware
- (c) OS/2
- (d) Unix
- (e) Mac OS
- (f) Windows NT
- (g) Windows
- (h) NeXTstep

App. Development Products

- Yes
- No

Networking Products

- Yes
- No

COMPUTERWORLD

E4K5-9

Viewpoint

Viewpoint

Verbatim

FROM A REPORT BY ANALYST STAN DOLBERG AT FORRESTER RESEARCH, INC. URGING INFORMATION SYSTEMS DEPARTMENTS TO FOCUS ON CUSTOMER-ORIENTED SYSTEMS:

Many large corporations have an internal focus that puts them in danger of losing market position. By failing to directly connect customers to back-office systems... these companies cede competitive advantage. [Information technology] must support marketing's need to quickly snap together new customer applications at "market speed."

Reinventing the back office for connecting to customers should be on the top of every chief information officer's priority list through the next decade. Smart companies will recast all [information technology] investments... based on revenue generation instead of traditional cost containment.

FROM A STATEMENT BY RYAN R. POPPA, CHAIRMAN AND CHIEF EXECUTIVE OFFICER OF STORAGE TECHNOLOGY CORP., ON HIGH-TECH ANTI-TRUST POLICY:

As competitors develop the better mousetrap, they must have the facility to attach that mousetrap to the other components of the system....

[For example,] access to operating system information was essential for VisiCalc in the development of its first spreadsheet, and access remains vital to all companies that do not own an operating system so that they can provide the advantages of their computer application programs to the consumer.

While this voluntary publication is often effective in promoting competition, it is also, obviously, subject to significant abuse. Operating systems can be changed rapidly, obsoleting the functionality of application programs. These changes can be either inadvertent or intentional. They might be made in order to [give advantage to] an application program that was developed by the owner of the operating system.

Dateline 1999: IS pros retire in droves

Michael Cohn

Alarmed about the year 2000? Worried about YY date fields showing up as 00? Afraid to ask the chief financial officer for somewhere between \$2 million and \$20 million to fix the two-digit year problem?

We in the IS field know the truth. The danger that date-critical calculations will go haywire is real, it's cataclysmic, and we're toast. Everything from legacy to LAN may be flat on its back. But you can't expect most folks to appreciate the impact of something that is more than four years away. Heck, my dry cleaner has trouble looking beyond next Tuesday.

So don't lose sleep or hair over the 2000 problem; there are a bunch of ways out of this mess. Show no remorse, have no regrets and choose your strategy from the list below.

1. **Retire.** Get out of the business and make it someone else's problem. This may be the most common solution: IS executives will bail out in droves. Come the third quarter of 1999, the world will be devoid of IS managers—and just in time for us to finally get something done.

2. **Relegate.** Another popular option is to assign the problem to someone else. Bury it within the ranks. Suck in some subordinate. Or, better yet, impose it on an innocent contract



The solution to the 2000 problem? Retire, relegate, repair, relocate or just relax.

programmer. "Hey, Stan, want to make \$24 an hour? Our 30 million lines of date-infected code should keep you busy for a while—especially since we can't even find half of it."

3. **Resign.** Face it, when the folks upstairs find out how bad the problem is, you'll get the ax anyway. So have a little pride. Hold your head high, walk up to the CEO and unflinchingly insist you're leaving, even though the date thing is not your fault and you've put in the best 19 years of your life as the director of IS. To which he or she will likely reflect, take a deep breath, look down on you and say, "Tell me... who are you again?"

4. **Re-engineer.** Get rid of all your old software. Install a bunch of new stuff. How tough could that be, converting about 17,000 assembler programs? Let's see, at three a week, not counting Christmas, you could probably do it

in... well... see option 3.

5. **Repair.** OK, be brave and make the fix. But why stop at YYYY? Go five-digit! That'll hold for another 98,000 years. It may seem extreme, but I'm fairly sure our office furniture has been around that long, not to mention Mrs. McGillicuddy in Accounting.

6. **Recycle.** If we have to do a bunch of date conversions anyway, I say let's start all over. Set the calendar to begin at Bill Gates' date of birth and make that O.A.G. (After Gates). Of course, that might screw up the name Windows 95.... Somebody better call the guy quick before they print up any more boxes.

7. **Relocate.** Move that data center to Honolulu. It buys you a couple of extra hours—and I bet you'll need them.

8. **Relax.** I figure we're doomed anyway. I'd guess that at one minute past midnight, New Year's Eve 1998, a bunch of enemy nations will try to bomb the heck out of us. We'll retaliate and hurriedly punch in our launch codes. The world will be watching as the system fires up and says, "Missiles activated. Time to launch: T-minus 100 years and counting."

Cohn works at a large computer company in Atlanta that will either expand its two-digit year fields or contract his five-digit salary.

We haven't gone to HAL yet

Max D. Hopper

Stanley Kubrick's 1968 epic movie *2001: A Space Odyssey* was special because it rigorously attempted to extrapolate the technology of its day and depict the advances we might credibly expect by a specific date in the future. It was a future so richly and realistically rendered that we could almost taste it.

Yet, now that the 2001 of real life is little more than five years out, we can see that our actual progress in space and computer technologies is nowhere near on schedule to fulfill that film's vision. Clearly, there will be no grand orbiting space station or thriving lunar colony by then. Bureaucracy and budget cuts have stymied our once-virile space agency.

And, despite an unprecedented explosion of innovation in information technology, our most advanced systems are still a long way from the movie's most colorful character, the HAL 9000 computer. HAL's ability to perceive and learn from its environment, converse naturally with humans, autonomously pursue its own (omnious) agenda and even demonstrate self-awareness meets the most demanding criteria for artificial intelligence. How far off this omnious mark are we?

If we agree that the key objective of computers is to augment human understanding, and we rank machine intelligence in a hierarchy that runs from data through information and



Dave: "Open the pod doors, HAL."
HAL: "I'm sorry, Dave; I'm afraid I can't do that."

knowledge to wisdom, then we have a basis for quantifying our progress.

While there's still some work to be done in the data layer, we have moved well beyond data tabulation and for the most part our corporate systems now live up to the term "information systems." They are used to integrate and interpret the relevant data for us, providing more pertinent and useful responses.

For knowledge, an even more sophisticated level of understanding, we need to integrate a fund of information in order to see patterns and trends that enable us to make the jump to insight and prediction.

Essentially, this is the function of expert and decision-support systems. Although performance has lagged promises, today many companies use these systems to make decisions about credit approvals, resource allocation and revenue optimization. Although these systems are far from perfect, there is no doubt that

we've established an encouraging foothold on the knowledge tier.

The lofty pinnacle of understanding that we characterize as wisdom involves such philosophical attributes as the humble awareness that the models we've constructed will not always hold true. Wisdom requires the intuitive ability, born of experience, to look beyond the apparent situation to recognize exceptional factors and anticipate unusual outcomes.

These elusive characteristics are rare in humans and totally nonexistent in our machines.

Before AI researchers can hope to develop applications that emulate this level of understanding, they will have to achieve a far more profound understanding of human thought processes. Beyond that, we'll need computers with more processing power—by many orders of magnitude—to approximate the capabilities of the human brain.

Today, we're about as far from achieving either of these objectives as space travel to the moon is from interstellar voyages. Each is a challenge of mind-numbing scale; yet, given the plodding progress of rocket science, my money's on information technology's getting there first.

Hopper, former chairman of AMR Corp.'s The Sabre Group, is principal at Max D. Hopper Associates, Inc., a consultancy in Dallas.

Lotus Organizer 2.1. Because WEDNESDAY'S

no
good
for
B O B.

12.1

Lotus
ORGANIZER

ORGANIZER 2.1 WITH
GROUP SCHEDULING.

There's some kind of cosmic waffle rule that applies to business meetings: if you reschedule once, you will have to reschedule a dozen times. Because if it isn't Bob, it's Joan, or Gayle or Jorge. And meanwhile, the perceived importance of any meeting is inversely proportional to the number of times it is pushed back. It's been proved.

And that's why there's the new Organizer™ 2.1 with group scheduling.

Organizer makes setting up a meeting easy. You choose your attendees from a point and click list. You see their availability. Once you've selected a time and location and posted your invitation, Organizer makes it easy for your invitees to accept, decline or send a delegate. Organizer works in conjunction with cc:Mail™ or Notes™ for users in

workgroups or across entire organizations.

Of course, Organizer is famous as a personal information manager—and now it goes a step further, adding group scheduling that's easy to install, use and support. Check out the new Organizer. For a free copy of our helpful booklet, *Managing Meeting Mania*, or for more information,

call 1-800-872-3387, ext. B313* Or explore Lotus on the World Wide Web at www.lotus.com.

*In Canada call 1-800-GO-LOTUS. ©1995 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus and Working Together are registered trademarks and Organizer, Notes and cc:Mail are trademarks of Lotus Development Corporation.

FLOOD OF NEXT-GENERATION
CHIPS EXPECTED TO
HIT MARKET, 41

Desktop Computing

PCs AND SOFTWARE • PORTABLE COMPUTERS

Get a grip on storage management

By Steve Moore

Managing data on multiple desktop PCs can be like trying to get dressed when your wardrobe is scattered across several rooms in overflowing drawers and closets.

Many client/server users are confronted with an out-of-control storage management mess, with overloaded servers supporting growing populations of desktop PCs that often are stuffed with a gigabyte or more of mixed corporate and personal information.

Desktop storage management — which spans backup, archiving and hierarchical storage management functions — "is one of those issues where you just throw up your hands because it's too large and too uncontrollable," said Ki Wilson, a senior micro-computer analyst at Stone Container Corp. in Chicago.

Many possible solutions

Corporate America is dealing with this problem, or in some cases isn't dealing with it, in various ways.

Most organizations end up with a policy like Stone Container's in which they "encourage users to put important data on the server or back it up on their local drive," Wilson said. But leaving end users in charge of critical data doesn't guarantee that the data will actually be backed up.

At Brewers Retail, Inc. in Mississauga,

Ontario, the company has "given each user what is essentially a private, [server-based] virtual network drive and [has] encouraged them to store all their sensitive information or large volumes of information on those drives," said Pomi Malik, the company's information systems director. As a result, "nothing really valuable is sitting on anyone's desktop," he said.

Still, short of mandating diskless workstations — a situation that would force users to store data on common networked drives — most organizations can't ensure that critical corporate data never resides on end-user desktops. And despite the risk that situation presents, few companies have the staff or budget to develop and implement effective PC storage management policies.

"We do not manage [storage] down to the desktop; we're having a heck of a time managing it at the network level," said Larry Lemay, a network engineer at Computer Language Research, a Dallas-based corporate tax processor.

With 1G- to 2G-byte disk drives becoming common on workstations and those drives typically holding 20M to 300M bytes of "real corporate data," protecting that data has become a major issue for the firm, he said.

Lemay and other users described the following four alternative desktop storage management strategies:

Storage management, page 41



Intelligent agents at work

Since no existing software is up to the job, Publishers Printing Co. is having a third party develop a custom application that will track individual files, using software agents running in the background.

Proactive data management is literally "a huge issue" for Publishers, which "can't have [printing] presses waiting for anything," said Hank Hensel, network manager at the big specialty printing firm. The company has about a terabyte of storage space to manage across 25 server and super-server domains, he said.

If employees can't get the information they need and deliver it to the printing press at exactly the right time, the Shepherdsville, Ky.-based printer faces expensive downtime.

The custom application, which will run on Unix and PC platforms, will also manage storage space on servers. This way, the software will "marry hierarchical storage management to a workflow process," Hensel said.

"I need to conserve disk space, but data has to be already on the drive when I need it, and I deal with 300M- to 400M-byte files. The only way to do that is with a very sophisticated data management tool," he said.

The company also is seeking to eliminate situations in which a server failure causes one user to pull data to a PC to work on it, and users on the next shift can't find that data.

"We will track where the data was saved to, who was working on it, how long they had it and how it was changed," Hensel said. Today,

data is tracked by a barcode system that depends on "wanding" of bar codes on employee badges and removable disks. Data ultimately will be tracked and moved electronically.

— Steve Moore

WE'VE ALWAYS SAID OUR MONITORS ARE TRIUMPHS OF TECHNOLOGY.

NOW, IT'S OFFICIAL.

The Nokia 447X has just been named a Best Buy by PC World. This adds to a long and growing list of awards and honors for Nokia monitors.

Ever since their introduction in the U.S., Nokia has been recognized by editors and sophisticated users alike as technologically superior in image quality and user-sensitivity.

As the need for quality monitors expands into



more homes and businesses, the appreciation of Nokia excellence grows with it. And, as more people look into Nokia, the appreciation of Nokia value grows too.

So if you're considering a new monitor, consider a

Nokia. Obviously, experts already consider them the best you can buy. For more information, please contact our Major Accounts Group at 415.331.6622.

NOKIA
MONITORS



Nokia monitors reduce eye strain when used with an appropriate graphics card. Manufactured and designed in Finland in an ISO 9001 approved environment. Size of CRT measured diagonally. Actual viewing size is slightly less. © 1995, Nokia Display Products, Inc. Multigraph, Valuegraph, Microvision and Fullscreen are trademarks of Nokia Display Products, Inc. E-Max, nokia@nua.com. Prices and specifications subject to change without notice. The Energy Star emblem does not represent EPA endorsement of any product or service. All other trademarks are the sole property of their respective companies.

Find out why Skadden Arps, one of the world's largest law firms, trusted Lawson at <http://www.lawson.com> or 1-800-477-1357.



© 1995, Lawson Software.

IT'S LIKE INVESTING IN BUSINESS SOFTWARE. IF YOU'RE SMART, YOU ONLY DO IT ONCE.

Sure, you might get lucky. On the other hand, you've got a lot to lose. That's why, when purchasing software, you'd better know exactly what you're getting into.

For example, Lawson Software supports all the leading client/server platforms. So no matter what hardware system you move to next, we'll be running

on it. And you can migrate through technological changes and upgrades without additional licensing fees.

Finally, twenty years of experience has resulted in some pretty amazing functionality. Ask our users. Call Lawson Software at 1-800-477-1357 for accounting, human resources, distribution and materials management. We're making it as painless as possible.

LAWSON
Software™

THE LAST TIME YOU'LL CHANGE
SOFTWARE COMPANIES.

Desktop Computing

Flood of next-generation chips predicted

Intel, Cyrix, AMD to release high-speed processors next year

By Jaikumar Vijayan

By the middle of next year, users will have a flood of microprocessors to choose from when a variety of next-generation chips hit the market.

These chips will be faster, smaller, consume less power and be packed with multimedia capabilities. They will be aimed at the portables, commercial desktop and consumer segments, industry analysts said.

"1996 is going to be the year of the Pentium-class processor. Prices have gone down, the market is evolving... [and] Pentium is going to be the generational processor that almost everybody will be using," said Mike Griffith, an analyst at In-Stat Research, Inc. in Scottsdale, Ariz.

This means users can expect relatively less-expensive alternatives to Pentium-based systems, particularly in the con-

sumer market.

Leading the pack will be Intel Corp., which is expected to keep revving clock speeds on its desktop Pentium processors throughout next year as it tries to push the chip deeper into the portables market.

The company's recent announcement of its Mobile Triton Peripheral Component Interconnect (PCI) chip sets, for instance, will set the stage for as many as five new notebook Pentium chip sets over the next year, according to a recent report in "Microprocessor Report," an industry newsletter in Sebastopol, Calif. Thus far, the Pentium chip has been slow to penetrate the mobile market.

Intel's upcoming mobile chips will range in speed from the recently announced 120-MHz chip to a 167-MHz chip and will incorporate better power management and 0.35 micron technology. Moving to 0.35 micron will

help Intel keep the chip's power dissipation to about the same level as today's mobile Pentiums but at much higher clock speeds, the report said.

Pushing Pentium performance further on the desktop and portables will be Intel's so-called P55C technology. This is an enhanced Pentium design with larger on-chip caches, lower supply voltage and new multimedia extensions.

In the forecast

Also due to ship in volume next year is the sixth-generation Pentium Pro, slated for launch Nov. 1. The chip will be initially positioned in the high-end Microsoft Corp. Windows NT-based workstation and symmetrical multiprocessing markets.

Intel declined comment on future products.

Meanwhile, rival chip maker Cyrix Corp. in Richardson, Texas, will produce a version of a

The next generation			
COMPANY/CHIP	INITIAL SPEED	CACHE	PLATFORMS/AVAILABILITY
Intel/Pentium Pro	150 MHz	16K bytes	Workstations, SMP servers and PCs/November
Cyrix/6x86	100 MHz	16K bytes	High-end PCs/Now
AMD/NexGen/K6*	180 MHz	48K bytes	High-end PCs/Second half of 1996

*After AMD's acquisition of NexGen, NexGen's Nx86 will become the K6.

fifth-generation multimedia chip. Aimed mainly at the consumer market, the chip will have an initial clock speed of 120 MHz, a PCI bus interface, an integrated graphics accelerator, a 16K-byte cache and new multimedia extensions.

"The window of opportunity [in the Pentium market] is moving fast, and all these vendors are trying to get products that will fit in the Pentium class before it starts hitting its peak, too," said Tony Massimini, an analyst at Semico Research Corp. in Scottsdale, Ariz.

Other chips scheduled to ship next year include the following:

• Cyrix's recently announced

MI chip, now called the 6x86 processor. The chip initially will have a speed of 100 MHz and be positioned for high-end desktop PC and mobile markets.

• The 180-MHz Nx86 from NexGen, Inc. The sixth-generation chip has been renamed the K6 following the acquisition of NexGen by Advanced Micro Devices, Inc. last week (see story page 32) and will be aimed at high-end commercial desktop users.

• AMD's long-delayed K5 Pentium clone, a 133-MHz 486DX4 chip mainly for the mobile market, and a watered-down 75-MHz version of its K5 technology for the entry-level desktop.

Storage management

CONTINUED FROM PAGE 39

- Equipping each workstation with its own backup hardware and software that users must remember to invoke.
- Installing shared departmental storage servers on which all or select data on LAN-attached PCs is backed up regularly by users or a local administrator.
- Making users responsible for loading their data at regular intervals onto large domain servers that central administrators back up to a central site over the corporate LAN or WAN.
- Purchasing or developing complex software for automated, remote backup of all workstations via the corporate LAN or WAN.

Unfortunately, each strategy has significant drawbacks, users said.

The first approach becomes more costly with each added PC supported, and users still may fail to do backups. The second calls for secure management of growing collections of backup tapes for each department, and the third and fourth solutions can bog down networks.

With 300M to 500M bytes of data to back up on each of the 1,500 workstations at Computer



Desktop storage management "is one of those issues where you just throw up your hands because it's too large and too uncontrollable."

Ki Wilson,
Stone Container Corp.
Chicago



"Nothing really valuable is sitting on anyone's desktop" without being backed up.

Pompi Malik,
Brewers Retail, Inc.
Mississauga, Ontario



"We are far less certain about managing data storage utilization on the desktop itself."

Nancy Wong,
Pacific Gas & Electric Co.
San Francisco

Language Research, "we're talking terabytes of data. And you just can't go across the wire with that type of data on a constant basis" when the corporate network consists of 4M and 16M bit/sec. Token Rings, Lemay said. The firm currently requires users to load their own data onto large network servers and is searching for a more effective, permanent solution, he

added.

The rapid rise of client/server computing has made PC storage management difficult even for large organizations with comprehensive technology management strategies. "Seventy percent of the [desktop data management] solution is in end users' hands," and today's sophisticated, independent-minded PC users "have to be ap-

proached in the right manner and shown the pros and cons" of new corporate data management practices, said Paul Jones, general manager of information services at Unocal Corp. in Anaheim, Calif.

But currently, "there is not a best practice for backing up to the desktop" largely because doing so "is all wrapped into security, virus protection, indus-

trial espionage and social engineering" issues, he said.

Backup isn't the only problem with PC-resident data. IS staffers also want to make sure that PC disks are sized properly so that they aren't overflowing or too empty. But cheap disks have made that a low priority for now.

After working with a benchmarking firm to determine best practices for storage management, Pacific Gas & Electric Co. in San Francisco concluded that "while there are some cost savings to be achieved by managing data storage utilization on file servers, we are far less certain about managing data storage utilization on the desktop itself," said Nancy Wong, manager of the utility's computer and network operations.

A key problem cited by users is the lack of "space management software" that can track new files as well as additions to existing files on servers and PCs. Computer Language Research must manage "literally millions" of files and would "run out of space just keeping a history on that," Lemay said.

In the mainframe world, Lemay added, "there were tools that could readily tell you" where the storage consumption culprits were. Despite a year-long search, he said he isn't "aware of any software out there in the LAN world that will help."

You
brought
them
Windows
and
e-mail
and
the internet.

Isn't it time you
brought them

and



EPSON COLOR INK JET PRINTERS. *It's not easy to drag the hesitant masses into the future. But it sure is fun. Seeing their eyes go wide. Hearing their expressions of murmured awe. You're standing on the mountain; you can see the promised land. So, where will you lead them? How about into a world of inspiration? Of expression. A world of 720 x 720 dpi of intense, Photo Quality color, and laser caliber text. It's Epson's world. All it takes to get there is about \$449 and a little vision. Call 1-800-BUY-EPSON x3400 or see <http://www.epson.com>.*



The line of Epson color printers starts at \$449. Get one, get 720 x 720 dpi of Photo Quality Epson Color, and enter an age of experimentation, kaleidoscope color, unbridled creativity. (And you thought the '60s were over.)

YOU'VE GOT TO SEE IT IN **EPSON** COLOR.™



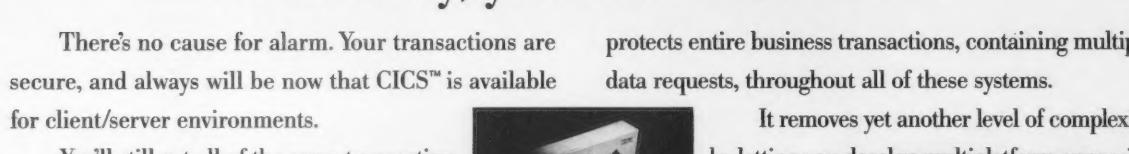
There are no transaction police.



No transaction homing devices.



And no transaction lost & found.



Fortunately, you don't need them.

There's no cause for alarm. Your transactions are secure, and always will be now that CICS™ is available for client/server environments.

You'll still get all of the same transaction processing capabilities with the rock-solid performance that many of the world's leading companies rely on for their most critical data.

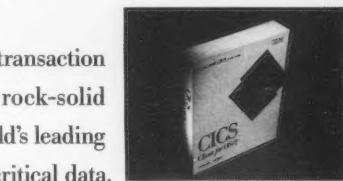
Only now, these tools will be working even harder

in client/server on DOS, UNIX®, Windows®, OS/400®, OS/2® and MVS/ESA™. As well as databases including SYBASE®, Informix®, ORACLE®, and of course, DB2®.

And let's not forget the latest user-oriented services like the Internet and Lotus Notes®. CICS manages and

protects entire business transactions, containing multiple data requests, throughout all of these systems.

It removes yet another level of complexity by letting you develop multiplatform apps with a single programming interface. All of which will eliminate those awkward compromises in your business network design.



Can your software do this?

To protect and safeguard all of your data today, give us a call at 1 800 IBM-3333, ext. DA 106. Or visit our site on the web at <http://www.raleigh.ibm.com/netad.html> for more details.

You've got nothing to lose if you do. And quite a bit to lose if you don't.

IBM

Solutions for a small planet™

HP UNVEILS LINE OF
STORAGE PRODUCTS, 48

ARCLAND TOOL HELPS BUSINESSES
MAP OUT WORKFLOW, 48

Workgroup Computing

LANs • SERVERS • SOFTWARE FOR GROUPS

NT aims for high end

By Jean S. Bozman

Like Chicago's fog in the Carl Sandburg poem, Microsoft Corp.'s Windows NT is creeping into the high-end enterprise server market on little cat feet.

Sales of Microsoft's Windows NT Server are booming for departmental servers; about 400,000 copies are expected to be sold this year. But users said they want NT to support larger hardware systems. The lack of such support means big data warehouse and mission-critical transaction systems will continue to run on other kinds of symmetrical multiprocessing (SMP) servers that are equipped with eight or more processors, users said.

Glitches remain

Chief information officers and information systems managers said they are excited about the idea of replacing expensive mainframes and high-end Unix servers with less costly NT servers. But technical concerns linger about scaling up databases (see story below).

Still, many customers have paid \$20,000 to

\$40,000 to install NT servers for departmental applications and databases and already are testing them for bigger jobs. They view NT servers as a low-cost alternative to large Unix servers that can cost \$100,000 or more.

"I'd like to make the high end go away," said David Starr, CIO of ITT Corp. in New York. "Just do distributed computing with a bunch of servers." Even now, he said, the \$7 billion firm has some data centers that are "big, empty rooms with a bunch of servers against the wall."

But ITT has large Unix servers, including IBM RS/6000s and Hewlett-Packard Co. HP 9000s, to handle high-end data warehouse applications, Starr said.

"We're using Unix because we haven't done this NT conversion. I would expect it to be a couple of years before we have everything converted," he said. Starr said he sees years of coexistence among Unix and NT servers on the network.

Union Pacific Railroad already is running a pilot program to determine which of its applications can be moved to NT platforms in the future. The railroad has six mainframes, 60 Unix servers and more than 150 Novell, Inc. NetWare servers in sites across several states.

"The question is, 'How much can NT push upward and take over some of the midrange and enterprise processing?'" said Mark Davis, director of data management at the railroad's Omaha offices.

Even Microsoft executives admit large NT systems won't arrive overnight. "The next release of NT absolutely will have better scaling," said Jim

NT servers, page 48

Scaling up is hard to do

Scaling up a system to run on more processors is a challenge for any operating system vendor, whether it is IBM, Hewlett-Packard, Sun Microsystems, Inc. or Microsoft.

For example, IBM added Unix SMP servers just last year and extended them to eight CPUs this summer. Windows NT, launched in July 1993, runs comfortably on four CPUs and even up to eight CPUs, Microsoft officials said. But 16 CPUs is still a reach, they said.

In comparison, some Unix systems have been scaled up to 32 or even 64 CPUs, analysts said.

Industry observers said Microsoft must work with hardware vendors to overcome potential bottlenecks in SMP servers. Key areas for scrutiny include cache memory, main memory and the speed of disk I/O. If any of those parameters isn't right, processors could become flooded with data, said Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass.

Mike Nash, Microsoft's group product manager for Windows NT Server, said it isn't fair to compare how NT and Unix handle their CPUs. The important thing, he said, is that NT can handle many CPUs. "The NT server, the applications and the scheduler don't worry about how many CPUs are in the system," he said. "That's transparent to them."

—Jean S. Bozman



ITT's David Starr says the company isn't rushing to convert to NT

ABA proposes controls on electronic signatures

By Gary H. Anthes

A legal framework for using digital signatures has just been published by an American Bar Association (ABA) committee. Its authors say the framework will act as a catalyst for adopting the technology and lead to more secure electronic commerce.

They also said the draft guidelines, which are open for public comment until Nov. 30, should serve as a foundation for the development of electronic commerce legislation. That may help head off a legislative Tower of Babel that the states are now creating, some observers said.

Digital signatures use cryptographic key pairs — one private and one public — to create tamper-proof messages. They aren't used to encrypt message contents for confidentiality but to ensure message integrity by providing a way to prove a message or file hasn't been altered in transit.

Digital signatures also ensure "nonrepudiation," protecting a recipient against a sender who falsely claims that he never sent a message.

The committee's 100-page document is essentially a long list of legal and technical definitions with amplifying explanations of the definitions. For example, it defines the required

properties of a "secure key pair" and offers references to other works on the topic.

The guidelines are intended to "establish a safe harbor, a clearly secure, computer-based equivalent" to pen-and-ink signatures, the draft said. The digital signature equivalent should minimize electronic forgeries, enable authentication of computer documents, facilitate electronic commerce and add legal support to technical standards for message authentication, the committee said.

"The guidelines are intended to stimulate a lot of thought as to what digital signatures are, how they are to be used, what the legal consequences are and



how one might want to design a certificate system," said Kenneth C. Bass, an attorney in the Washington office of Venable, Baetjer, Howard & Civiletti and a member of the committee drafting the report.

The ABA paper devotes a lot of attention to the legal duties and liabilities of trusted "certification authorities," which maintain directories of public keys.

Signatures, page 48

Briefs

64-bit SPARC-ettes debut

Fujitsu Ltd.'s HAL Computer Systems, Inc. subsidiary in Campbell, Calif., recently announced a 64-bit Unix workstation based on the unit's SPARC64 RISC chip. The high-performance unit includes SPARC64/OS 2.4, a 64-bit operating system that is based on Sun Microsystems, Inc.'s Solaris 2.4 Unix system. Art Goldberg, marketing vice president at HAL, said the computer is the first 64-bit SPARC-compatible workstation on the market. It costs \$33,000.

Entry-level RAID

Storage Dimensions Co. in Milpitas, Calif., has introduced SuperFlex 1000, an entry-level RAID storage system that initially will support Novell, Inc.'s NetWare, Microsoft Corp.'s Windows NT and IBM's OS/2 operating systems. A basic SuperFlex 1000 system with three 2G-byte drives and a RAID card costs \$7,035.

Performance problems?

Landmark Systems Corp. in Vienna, Va., has announced PerformanceWorks, a suite of client/server performance management software that lets administrators troubleshoot slow response times,

analyze performance trends and do capacity planning. The software can gather performance data about an application's use of a Unix or PC system's CPU, memory and other resources. Starter kits are available now and cost \$7,500.

SGI adopts new licensing

Silicon Graphics, Inc. has adopted Globetrotter Software, Inc.'s Flexlm software license manager for use with its systems. Flexlm replaces Gradient Technologies, Inc.'s NetLS software as SGI's licensing system. SGI also will use Flexadmin, a software asset management utility developed by Globetrotter.



**START WITH THIS BOX
AND YOU CAN
THINK OUTSIDE ANY OTHER.**



pentium
PROCESSOR

Designed for
 Microsoft
Windows 95

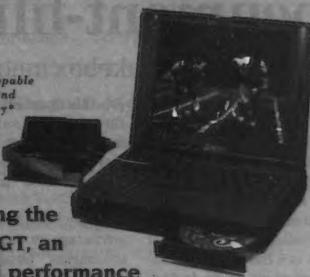
*2nd HDD and 2nd battery are both optional. Copyright © 1995 Zenith Data Systems Corporation. Zenith Data Systems is a Bell Company Systems Corporation. Intel Inside logo and Pentium logo are registered trademarks of Intel Corporation. Windows is a registered trademark.

WITH THE ZENITH LAPTOP, THERE ARE NO BOUNDARIES TO INTERACTIVE INFORMATION. CHANGE IS THE KEY TO INNOVATION WITH THE ZENITH LAPTOP. NO MATTER WHERE YOU GO, YOU HAVE ACCESS TO THE WORLD ON THE ZENITH LAPTOP. YOUR IDEAS ARE PART OF THE BIGGER PICTURE WITH A LARGER ZENITH LAPTOP. BROADCAST QUALITY VIDEO CAPTURE LETS YOUR PRESENTATIONS GO AS FAR AS YOUR IMAGINATION. START WITH THIS BOX AND YOU CAN THINK OUTSIDE ANY OTHER.

HOW FAST YOUR MIND WORKS,
IF YOU CAN SEE IT IN YOUR MIND, YOU CAN SEE IT IN
YOUR WORDS. ADDS NEW DIMENSION TO YOUR WORDS.

PENTIUM PROCESSORS KEEP UP. ▶

SmartBay™-Swappable
CD-ROMs/FDDs+2nd
HDD+2nd Battery*



Introducing the
Z-NOTE® GT, an
advanced performance
notebook PC, optimized for multimedia.

With endless features and the power of Pentium® processors, the Z-NOTE GT gives your company the tool to do anything you can imagine. Sales presentations fly with hardware MPEG support which allows for 30 frames per second, full-motion video playback. Graphs and charts pop in high-resolution color on oversized 11.3" SVGA displays (select models). And the power comes from where you need it with our ingenious SmartBay which lets you swap CD-ROM for FDD for optional 2nd HDD for optional 2nd battery. All told, the Z-NOTE GT is the multimedia solution for your company. Because you've never seen a notebook computer that can take you so far.



SPECIFICATIONS

75 or 90MHz Pentium processor
PCI Bus architecture
Video graphics accelerator
8-40MB RAM
810MB/1.3GB HDD
Swappable CD-ROM/FDD/optional 2nd HDD/
optional 2nd battery
10.4" and 11.3" TFT SVGA and 11.3" DSTN SVGA displays
Extended battery life with NiMH or Lithium Ion
Designed for Windows 95
NTSC/PAL video out for TV connect
1 Type II and 1 Type III PC Card slots
Optional hardware MPEG support

1-800-289-1320 Ext. 5746
<http://www.zds.com>

ZENITH
DATA SYSTEMS

Make The Connection™

Workgroup Computing

Document-filing products keep HP current

SureStore server, jukebox among latest releases

By Stewart Deck

Hewlett-Packard Co. recently marched out a full load of storage products, including disk drives, a digital/audio tape drive and new tape storage systems. Leading this parade of products is a line of document-filing storage products, including an optical jukebox.

Hewlett-Packard is the No. 1 U.S. provider of optical storage products, according to a recent study by International Data Corp. In an effort to maintain its top position, the Palo Alto, Calif.-based company unveiled SureStore Archive Server and SureStore 165G-byte Optical Jukebox (see chart). Both products target the quickly growing market for document-filing systems.

"Hewlett-Packard has been one of the dominant players

[in this market] for the past three years," said John Freeman, president of Strategic Marketing Decisions, a market analysis firm in Los Gatos, Calif.

"They need to maintain that advantage by staying current in the market," he said.

Freeman said the document-filing systems market has grown 67% in the past year and is expected to more than triple by 1998.

Stiff competition

In order to fend off competition from companies such as Plasmon Data Systems, Inc. in Milpitas, Calif., HP must continue to rapidly bring products to market, Freeman said.

The SureStore Archive Server is already in place at Blue Cross/Blue Shield of Mississippi. Wade Matthews, PC ad-

ministrator at Blue Cross, said the company uses the box for "near on-line storage of forms."

Prior to installing the Archive Server, company employees who needed copies of a specific

form had to call someone in the graphics department. That person frequently had to burrow through stacks of paper to find the form, Matthews said.

If they couldn't find it, "they'd have to get out the graphics plates, print a bunch of forms

and then put most of them on a shelf somewhere," he recalled.

With the Archive Server, the forms are stored as images that can be retrieved and printed, Matthews said.

Big help

The Archive Server also has helped Gene Lester, president of North Texas Computer Service, Inc., streamline his business processes.

The server "knows where everything is," Lester said. His company keeps images of configuration files on the Archive Server.

Lester said the server has forced the company to decide what will be stored on-line and what will be kept off-line.

But making those decisions is far more enjoyable than having to "go back again into the computer room and manually change the external optical disc," he said.

Product parade		
PRODUCT	TYPE	PRICE
HP SureStore Optical Jukebox	165G-byte optical jukebox	\$40,000
HP SureStore Archive Server	Archive server for Novell's NetWare networks	Starts at \$8,950
HP C3635A	8.7G-byte hard disk	Starts at \$1,500
HP C1537A	24G-byte digital/audio tape drive	\$1,150
HP Colorado T4000s	8G-byte tape storage system	\$399

Arcland's FlowModel tool helps firms chart workflow

By Tim Ouellette

Companies looking to map their business processes now can test these processes at the same time with a new low-cost software bundle from Arcland, Inc.

The FlowModel 2.0 + BenchMarker 3.0 Solutions Pack from the Malvern, Pa., firm lets users model processes and link related data directly to objects in the chart. Users can then analyze the efficiency of each process.

With FlowModel's data exporting features and the addition of a strong benchmarking capability, analysts and users lauded the strength and flexibility of the product.

Albany International, a paper product manufacturer in Albany, N.Y., uses the \$695 Solutions Pack to document existing workflows and manufacturing process flows in relation to the firm's recent ISO certifications, said Michael Moriarty, supervisor of pressing research and development.

FlowModel 2.0 was designed to look and work like Microsoft Corp.'s Office suite and runs under Microsoft's Windows 95. It lets users link data to flowchart objects.

The software also provides a complete view of the process, ranging from events to relationships to associated data and applications.

BenchMarker 3.0 was developed by Fleet & Partners, Inc. in Richmond, Vt. It reviews flow diagrams from FlowModel and identifies defects, trends and efficiencies based on various standard benchmarks.

Workflow map

Users of high-end, high-volume workflow systems, which automate the flow of work companywide, could take a Flow-

Model diagram and use it as a building block for these workflow systems, said Kim Shah, president and chief executive officer of Arcland.

But this is only for systems that support Microsoft's Messaging Application Programming Interface. "It is not ready to integrate directly with workflow systems," said Nathaniel Palmer, an analyst at Delphi Consulting Group, Inc. in Boston. "But it is not necessary to use for a prelude to automated workflow."

For example, one beta user described a simple way to map and track workflow without automating it.

Users could create a FlowModel diagram of an ongoing project and record their progress against the model by exporting data from FlowModel to Microsoft's Excel spreadsheet, said Pat Harty, vice president of finance and operations at STI Optronics, Inc. in Bellevue, Wash.

No-brainer

A Layout All feature in FlowModel lets users brainstorm a process without concern for design issues. The feature then automatically redraws the diagram into a coherent chart.

For example, one beta user described a simple way to map and track workflow without automating it.

Users could create a FlowModel diagram of an ongoing project and record their progress against the model by exporting data from FlowModel to Microsoft's Excel spreadsheet, said Pat Harty, vice president of finance and operations at STI Optronics, Inc. in Bellevue, Wash.

NT servers

CONTINUED FROM PAGE 45

Allchin, senior vice president of Microsoft's business systems division in Redmond, Wash. The next scheduled release of NT will be sometime next year. Cairo, the object-oriented version of NT, will be out in 1997, analysts said.

Allchin said NT already does well on eight CPUs. He agreed that NT needs to scale higher but refused to specify how and when that would happen.

However, the clustering of multiple NT servers, due to start next year, will ease scaling issues for NT, he said.

Clustering smaller NT servers may compensate for individual NT servers that have reached their capability limits, users said.

Microsoft is working with Compaq

Computer Corp., among other vendors, to do exactly this. At the same time, Microsoft and its open systems partners, such as Digital Equipment Corp. and AT&T Global Information Solutions, will work to make sure NT does even better on SMP scaling by 1997, analysts said.

Big bang

Sales of Microsoft's 32-bit NT operating system are booming, with more than 1 million copies expected to be sold this year. NT Server sales account for about 400,000 of the total units, analysts said.

"It does [depend] on having very high bandwidth on your network," he said.

"The concept is to make a big machine out of a lot of little ones, but it's a different architecture. I think this makes all kinds of sense."

Senior editor Stuart J. Johnston contributed to this story.

Signatures

CONTINUED FROM PAGE 45

The keys are issued in tamper-proof "certificates" that also contain the key holder's name, address and other information.

The certificates can help facilitate trusted business transactions between parties that may or may not know one another.

VeriSign, Inc., one such certificate authority, said the ABA guidelines are a welcome relief from a plethora of conflicting ideas about digital signatures.

Web Augustine, vice president of marketing at the Redwood City, Calif., company said some states have already enacted legislation and more are in the process.

"There are many different interpretations of what digital signatures are and how they can be used," Augustine said.

After a decade of breaking down functional barriers in companies, why do we continue to keep structured and unstructured information apart? Relational databases are stuffed with structured information that is hard for non-technical business professionals, such as salespeople and managers, to access and use. Yet, unstructured information stored in e-mail messages, faxes, spreadsheets and word processing documents is an equally valuable source of corporate knowledge.

As demand for more strategic use of information grows, IT departments must respond with new business applications that unify structured and unstructured information and make it available for day-to-day business use.

Until now, the challenge has been how to leverage information in relational database management systems (RDBMSs) for a wide range of client/server applications. Recently, the rules have changed again. Today's critical applications must meet even tougher requirements: sophisticated workflow processing, enterprise-wide connectivity to customers and suppliers, and support of increasingly mobile users. The sticking point is that transaction-oriented applications are frequently difficult to enhance and modify, and are not architecturally designed to support these new application requirements.

Groupware has emerged as a technology that complements the strengths of RDBMSs. Most people know that groupware is designed to manage and distribute documents anywhere in the enterprise, but far fewer are aware that groupware can give users access to both structured and semi-structured information, regardless of location or computing platform.

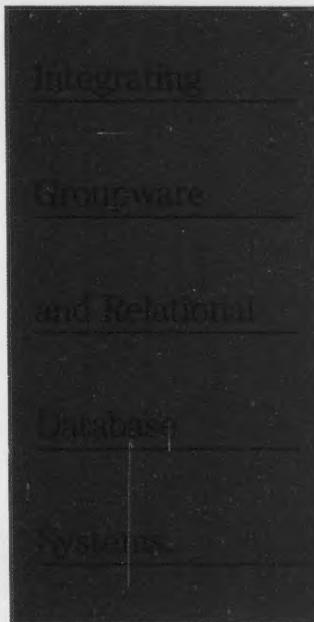
To integrate effectively with RDBMSs, a groupware product must:

- Offer a variety of straightforward database connectivity options

- Provide robust support of distributed workgroups and mobile users
- Enable workflow automation to move information through a business process.

Lotus Notes: A Hub, Not An Island

Lotus Notes® is the tool of choice for building high-return applications that



leverage relational and non-relational information. With a variety of data integration products to choose from, developers can now extend groupware applications to include relational data. For many business professionals, Notes' easy and intuitive user interface becomes the central launchpad to a universe of vital business information. For developers, there are flexible options for integrating data at the application level or even at the server-to-server or transaction level.

Notes™ supports access to the leading RDBMSs. And because Notes runs on all popular computing platforms and supports the leading APIs, you can quickly build applications to distribute and update

information — even application design updates — wherever it's needed.

The Payoff: World-Class Applications

Now applications can pull human resource information from transaction systems into Notes-based applications that automate the entire hiring process, from searching for candidates with specific experience to making job offers.

Companies can more effectively win competitive bids by quickly generating accurate and complete proposals integrating the latest cost information from transaction systems with the rich document authoring capabilities of Notes.

In hundreds of sales organizations, Notes fosters "virtual" team selling by coordinating the latest information gathered from such disparate sources as call reports, real-time news feeds and financial transaction data. Salespeople can continuously and securely update colleagues anywhere in the world with the latest customer or competitive information.

Field-based work crews can be managed more effectively when work order transactions are distributed via Notes. As jobs are completed, crews replicate updated information back to headquarters.

The technology may be sophisticated, but the point is simple: anywhere structured and unstructured information must come together to create business value and support critical decisions, there's only one groupware product that combines the ability to communicate, collaborate and coordinate with efficient, reliable RDBMS integration. **Lotus Notes**.

Lotus
Working Together®

TRUE PERFORMANCE IS NOT
MEASURED BY A SINGLE EVENT.



New Sybase
S Y S T E M 11™

XI

PERFORMANCE OPTIMIZED
for every level of your business.

Strength. Power. Versatility. They're the qualities of a triathlete. And what you get from new Sybase® System 11™. It's the only software that lets you perform in all three areas of distributed computing—on-line transaction processing (OLTP), data warehousing and mass deployment.

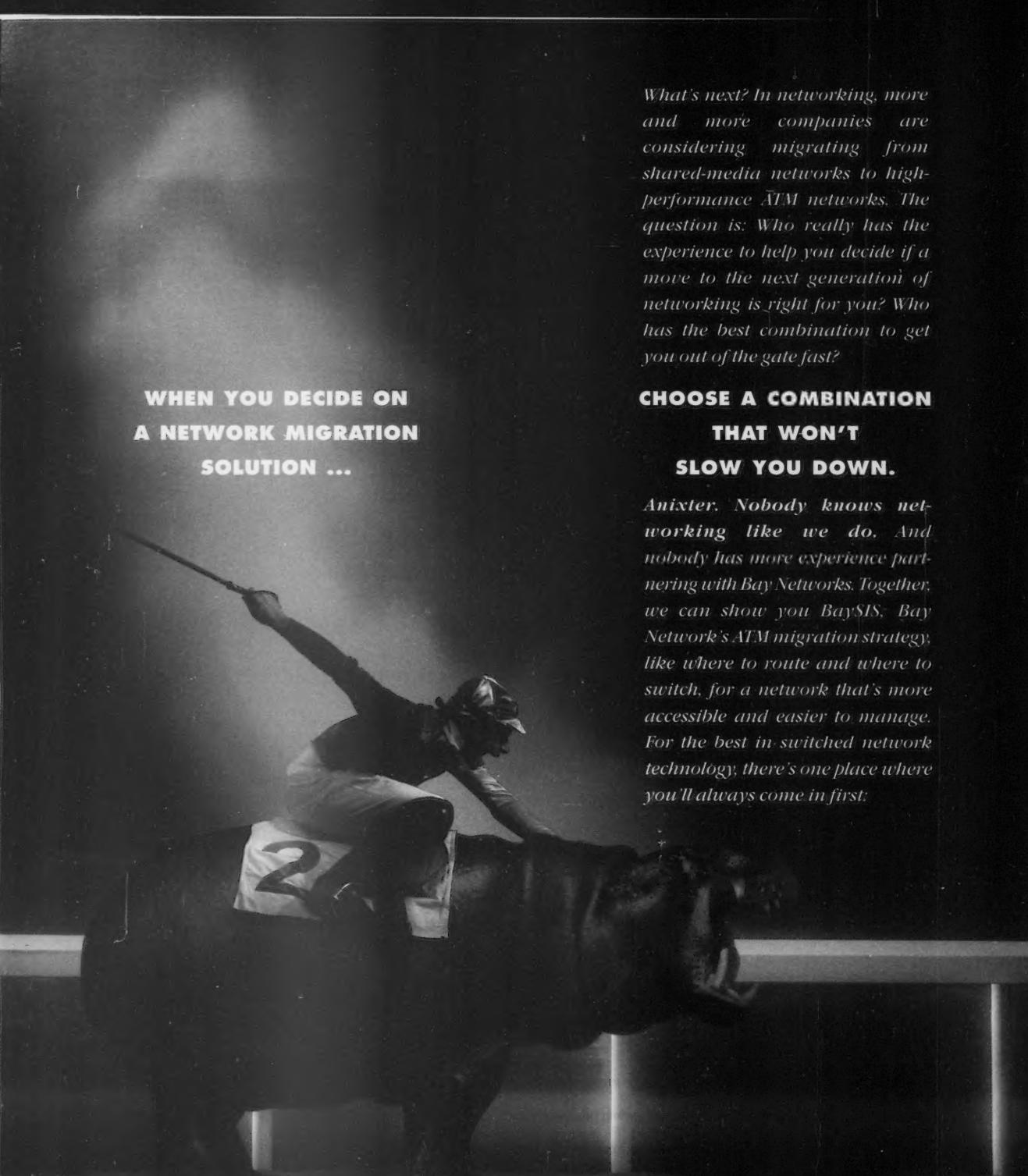
How does System 11 give you this edge? It gives you a single architecture

IT IS MEASURED BY THREE.



with optimized solutions—each one built to perform a specific task. So you get the ultimate performance and scalability for OLTP. The fastest query responses from your data warehouse. Plus a small footprint you can deploy places you've only dreamed. And the benchmarks? Record-breaking. For a specific, detailed report, call 1-800-SYBASE-1 ext. 9199. Or check out our Web site at <http://www.sybase.com/>. You'll find that no one gives you more power in one event. Let alone all three.

SYBASE
The Architecture for Change™



**WHEN YOU DECIDE ON
A NETWORK MIGRATION
SOLUTION ...**

What's next? In networking, more and more companies are considering migrating from shared-media networks to high-performance ATM networks. The question is: Who really has the experience to help you decide if a move to the next generation of networking is right for you? Who has the best combination to get you out of the gate fast?

**CHOOSE A COMBINATION
THAT WON'T
SLOW YOU DOWN.**

Anixter. Nobody knows networking like we do. And nobody has more experience partnering with Bay Networks. Together, we can show you BaySIS, Bay Network's ATM migration strategy, like where to route and where to switch, for a network that's more accessible and easier to manage. For the best in switched network technology, there's one place where you'll always come in first.

ANIXTER



Bay Networks

1 - 8 0 0 - A N I X T E R

©1995 Anixter Inc. BaySIS is a trademark of Bay Networks.



Enterprise Networking

INTERNETWORKING • SERVICES • NET MANAGEMENT

Micromuse cools network cacophony

By Patrick Dryden
DALLAS

In large distributed environments, "console chaos" can cause central management staff to miss critical alerts.

Client/server environments generate tons of information about networks, systems and applications. Users and analysts say revamped monitoring software from Micromuse USA can help administrators make sense of it all.

Netcool/Omnibus collects data from element managers and management platforms, filters duplicate alarms and correlates events so that support staff can define and manage specific functions. That means router and electronic-mail teams, for example, can have their own vir-

tual network monitors that warn them when a certain service is in jeopardy.

Version 3.0, introduced last week at Enterprise Management Summit 95 here, boosts performance, scalability and ease of operation through a complete rewrite of the prior Netcool/Omnibus software (see box, page 58).

Needle in a haystack

One beta tester praised the enhanced command interface because he could type in a rule or point and click to diagram a relationship for controlling alarms, according to Jill Huntington-Lee, an analyst at DataPro Information Services Group in Delran, N.J.

Huntington-Lee said that is the kind of help needed to control growing networks.

"So many alarms happen in a command center that the staff needs a way to make important events rise above the noise," she said. "Writing scripts to fil-

ter alarms can take months, but Netcool/Omnibus does it on the fly and can work across platforms."

Broader platform support let

a beta-tester, whose corporate policy prohibits identification, run the monitor on Hewlett-Packard Co. HP-UX systems.

Micromuse, page 58

Digital adds firewall offering

By Michael Goldberg

Accessing the Internet for private communications is an alluring prospect for users looking to save money on leased lines while harnessing the reach of a vast public network. For those concerned with confidentiality and information security, however, the Internet looks more like a jungle than an interstate.

Digital Equipment Corp. has entered the growing field of vendors offering firewall and tunneling products that claim to employ data encryption and user detection techniques to create "virtual private networks."

In May, Digital introduced a series of firewall

products to regulate access from the Internet into a private network. Last week, the Maynard, Mass., company unveiled two tunneling products — The Internet Group Tunnel and the Internet Personal Tunnel — that can transport data across the Internet and through firewalls made by Digital and most other vendors.

Security

Observers said Digital's approach of separating the two technologies — the protective firewalls and enabling tunnels — is a departure from the status quo, whereby both capabilities are bundled into one package.

"Right now, tunneling is looked at as a valuable added feature that's embedded with some other

Digital, page 58

ISDN, I presume? Livingston drops prices to rock bottom

By Bob Wallace

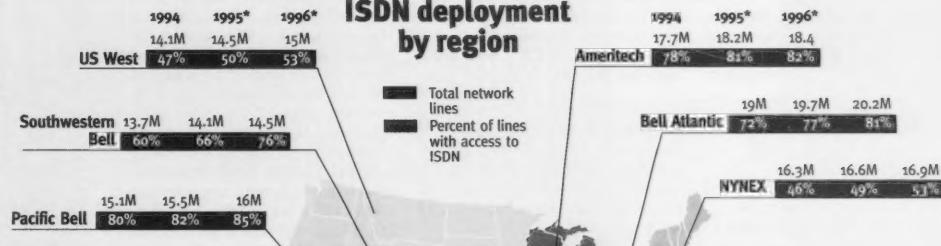
Livingston Enterprises, Inc. last week announced Integrated Services Digital Network (ISDN)-based remote access products that analysts said include the industry's lowest priced ISDN PC card.

Users say low-priced cards, combined with Microsoft Corp.'s recent commitment to support ISDN in its Windows 95 operating system and the Federal Communications Commission's efforts to reduce ISDN prices, are making ISDN very attractive.

The product family includes a \$299 ISDN modem card for Industry Standard Architecture bus PCs, an ISDN branch office router with an ISDN interface for \$1,195 and a remote access server that can support 10 ISDN lines starting at \$4,690.

"The PC card is easily the cheapest I've seen, with most similar products [priced] well over \$400," said Mike Finneran, president of dBrn Associates, Inc., a Hewlett Neck, N.Y., firm that specializes in ISDN education and consulting. "And the pricing for the router seems very low."

Users said Microsoft's support for ISDN in its operating



*Projected
Source: RBHC reports to Bell Communications Research, Red Bank, N.J.

system eliminates the need for ISDN-specific applications. Now any applications written for Windows 95 will be compatible with ISDN.

"What a difference a year makes. We're excited and think ISDN's on the right track. This market is really going to grow rapidly," said Bill Horst, chief of the General Services Administration's communications branch in Philadelphia.

A very big drop

The Pleasanton, Calif., company's announcement means users can get the performance increase of ISDN — more than four times that of dial-up lines — for several hundred dollars less per unit.

At \$1,195, the Livingston ISDN router costs \$800 less than a similar product from router market leader Cisco Systems, Inc.

Though not yet ubiquitous or consistently provided by vendors, ISDN Basic Rate Interface (BRI) service is available on more than 50% of each regional Bell holding company's (RBHC) total network lines (see chart).

The products include the following:

• The 128K bit/sec. PowerLink128 ISDN Modem for PCs with AT buses costs less than a V.34 modem, which only gives 28.8K bit/sec. performance.

It supports Intel Corp.'s Plug & Play feature, which means the device automatically configures itself once it is installed. The product will ship in December.

• PortMaster ISDN Office Router has one Ethernet, one BRI and one dial-in port. It supports

multilink Point-to-Point Protocol, which lets the device combine the BRI's two B channels to form one 128K bit/sec. link. It will also ship in December.

• PortMaster ISDN Communications Servers were designed for large central sites and can be equipped with two five-port BRI modules. They support as many as 20 64K bit/sec. channels from remote users and come with 10 dial-up ports for users looking to support a mix of access links.

PortMaster ISDN Communications Server will ship next month for \$4,690 with five BRI ports and for \$6,685 with 10 BRI ports. Users can add five-port BRI modules to Livingston Port-Masters for \$1,995 each.

Newspapers turn to Web for on-line help wanteds

By Gary H. Anthes

After a decade of small steps and meager returns, the newspaper industry recently got into the on-line recruitment advertising business in a big way.

Six of the nation's largest daily newspapers posted 21,000 help wanted ads to a common World Wide Web site, CareerPath.com. The Internet service, which is free to job seekers, includes a flexible search engine to locate jobs by geographic region, job category and keywords in job descriptions (see related story below).

The newspapers are part of the New Century Network, an Internet content development and distribution consortium founded in May by nine media companies. The newspapers are *The Boston Globe*, *Chicago Tribune*, *Los Angeles Times*, *The New York Times*, *San Jose Mercury News* and *The Washington Post*.

Analysts said the on-line service is unlikely to bring the newspapers significant revenue any time soon. Rather, they suggested, the newspapers

see the Internet as one way to protect their \$13 billion annual classified advertising market.

Some of the newspapers, such as the *Mercury News*, won't charge their print advertisers anything extra to

electronic classifieds, both from competitive reasons and market expansion reasons."

Arlen said computer access provides advantages over print media for classified advertising. "Say I am in Washington, and I'm looking to move to Chicago. I can automatically search for a home in the \$400,000 range with four bedrooms, and so forth," he said.

"This is an investment in the future," said Miles Groves, vice president of market and business analysis at the Newspaper Association of America in Reston, Va. "If we don't develop our editorial and advertising products online, someone else will."

More than 100 U.S. newspapers have Web sites, and more and more are putting local classified ads on them,

Groves said.

Follow the money?

Timothy Landon, a vice president at the *Chicago Tribune*, said the newspaper has had an on-line publishing venture under way with America Online, Inc. for some time. "We haven't made a ton of money," he admitted. "It's been hard to make revenue in the electronic market."

But that is beginning to change, Landon said. He said the *Tribune* set up a Web page for local recruitment advertising six months ago. Sixty percent to 70% of its advertisers pay the \$1-per-line surcharge to get their ads on the Web. "It will be a significant revenue stream for us this year, hundreds of thousands of dollars," he said.

The newspapers issued a statement saying they eventually will accept ads for Internet-only display. They also said they will enhance CareerPath.com to include company profiles and "alerts," which would notify an employer or job seeker when a candidate or job with a certain profile comes on the market.

Where it's at

Six newspapers put 21,000 help-wanted ads on-line at <http://www.careerpath.com>. Users could select any or all of the newspapers, any of dozens of job categories and keywords for searching for job descriptions.

For example, a search of *The New York Times*' recruitment ads for job descriptions containing the word "computer" turned up 877 jobs in 57 categories from "accounting" to "warehousing."

A click on "management" dis-

played four detailed job descriptions in that category, such as one from Dollar Rent-A-Car Systems, Inc. seeking someone knowledgeable about "car rental computer software."

But looking for "chief information officer" in all six papers turned up no hits after two minutes of searching.

The search engine ran out of gas after four minutes looking for "programmer" positions at all six papers. It displayed the message, "The search engine is unable to complete your query. Try submitting your query again."

— Gary H. Anthes

Briefs

Find a bug, win a prize
Netscape Communications Corp. has announced a "bugs bounty" program that rewards users who find bugs in beta

copies of Netscape's Navigator 2.0 Internet browser. The first people to report a problem to the Mountain View, Calif., vendor can get cash, coffee mugs and other Netscape paraphernalia, depending on the severity of the bug. See <http://www.netscape.com> for more details.

Surfing on CompuServe

CompuServe, Inc. in Columbus, Ohio, has announced Spryte, a \$4.95-per-month program that lets subscribers surf the Internet. The program, which is due to be available by year's end, includes three

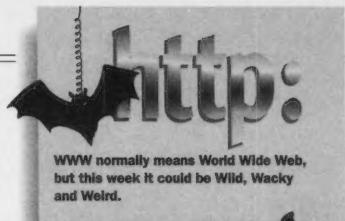
hours of dial-up Internet access per month plus the software to make it happen. Additional hours are \$1.95 each.

Secure middleware offered

Working Set, Inc. in Lexington, Mass., has announced

DataRamp, middleware designed to give users secure Internet access to data stored in corporate relational databases.

DataRamp uses encryption technology from RSA Data Security, Inc. in Redwood City, Calif.



WWW normally means World Wide Web, but this week it could be Wild, Wacky and Weird.

If you visit just one Internet Halloween site before going out trick-or-treating this year, visit the *Den of the Dead* at <http://ucsu.colorado.edu/~anschutz/dead.html>. There you will see various "ghastly activities," starting with two skeletons making love. But this is no porno site. You can download Halloween party hints and scary songs, shop for Halloween merchandise, read spooky stories and link to hundreds of other haunted Web sites.

One of those links is to *Phantasmagoria* (<http://mandrake.Lib.Lehigh.EDU/>). You can bypass this one if you have anything less than a 28.8K bit/sec. modem and special "viewers" for processing pictures, sounds and video. The sounds — such as a woman's scream, dragging chains and a graveyard dog — are manageable at 100K bits or so. But you might want a direct connection via a T1 line for the 5Mbits-plus film clips and the three-dimensional graphics rendered by a Silicon Graphics, Inc. supercomputer.

Phantasmagoria can also get you shareware Halloween games in .EXE and .ZIP files and to "chiller fonts" and "scream savers" in .ZIP format.

If you're into *Godzilla*, check out *Mark Meloon's Godzilla Page* at <http://www.am-a.caitech.edu/~mmr/godzilla.html>. (Why are all these servers at universities? Don't these kids have anything better to do?) *Godzilla* toys, movies, pictures and posters are available here.

You can buy body parts from the *Halloween Mart* in Las Vegas at <http://www.accessm.com/halloween/>. A cutoff finger is just \$2.50, but a full size latex mummy will set you back \$135.

More "horror products" are available from Steven's Magic Emporium in Wichita, Kan., at <http://www.radiks.net/halloween/>. This is serious stuff: a 150,000-volt stun gun for \$80 and a fog machine — "ideal for haunted houses" — for \$999.99. I don't think we're in Kansas anymore, Toto.

The only site not likely to gross you out is the *Virtual Haunted House* at the *MidLink Magazine* site (<http://longwood.cs.ucf.edu/~MidLink/haunted.html>). There you will find charming and colorful Halloween pictures created by grade-school kids. This is what Halloween is all about.

— Gary H. Anthes



We

liberate

where

other

systems

dominate

Why be a prisoner to your accounting system?

Now you can escape the restraints of conventional accounting software. CODA's unique client/server product design unlocks the true potential in your business. Enabling integration with other world-class technologies and enterprise applications, allowing you to choose the best solution for your business.

Liberating information. Across companies. Across continents. Empowering your people to make accurate, timely, better informed decisions.

Supporting continuous changes in your business

and technology strategies - not dominating them.

Giving you the freedom to determine the direction and pace of change in your organization.

Delivering implementation speed with rapid returns. Eliminate the need to compromise on your accounting solution.

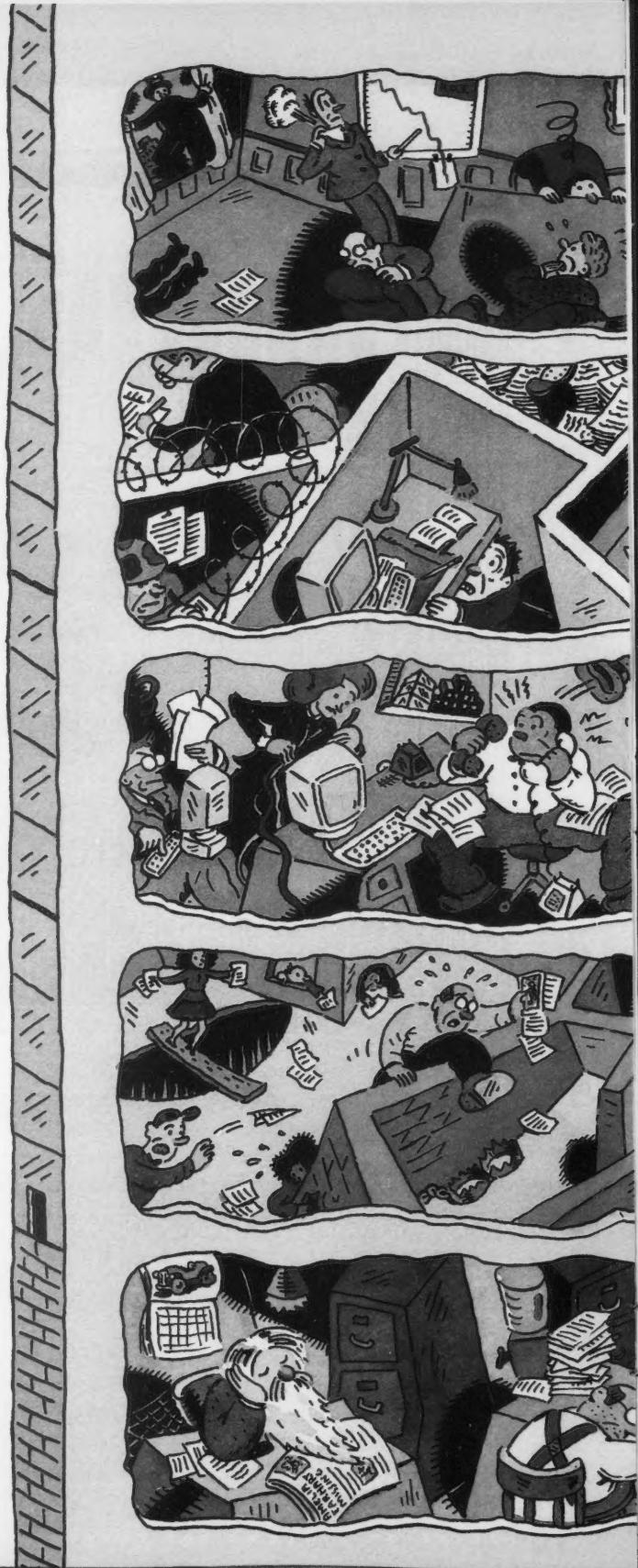
If you would like to discuss the value that Liberation Systems can bring to your business, feel free. Call +1 (603) 647 9600 or E-Mail: liberate@codainc.com.

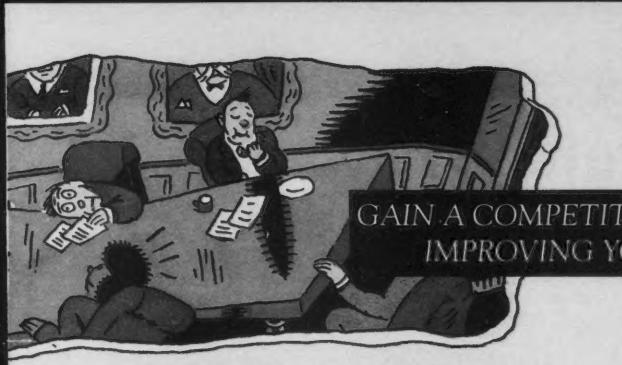
Liberation Systems for Enterprise Accounting

CODA



RUN
BUSINESS
BETTER
FROM THE
BOARDROOM
TO THE
BASEMENT.





GAIN A COMPETITIVE ADVANTAGE WHILE IMPROVING YOUR BOTTOM LINE.



SAVE TIME AND MONEY DISTRIBUTING AND REVIEWING DOCUMENTS ELECTRONICALLY.



PUBLISH IT ONCE IN ACROBAT AND DISTRIBUTE IT ANY WAY YOU WANT.



PUBLISH DOCUMENTS ON THE WORLD WIDE WEB FASTER THAN EVER.



ADOBE ACROBAT CAPTURE. BRINGS PRINTED DOCUMENTS BACK TO LIFE!

Whatever level you're on, Adobe™ Acrobat™ software will revolutionize the way your business works with electronic documents.

Acrobat software lets you publish, access and manage

your documents electronically, preserving their original look and feel. And you can send them anywhere. You'll reduce the cost of information because printing, production and distribution costs are drastically reduced. At last,

workgroups can work like real groups, sharing even the most complex documents with each

other electronically and instantaneously. You won't have to juggle conflicting forms of media because Acrobat works with everything including CD-ROMs and Lotus Notes® software. Just publish a document once in the Adobe Portable

Document Format (PDF) and distribute it universally to anyone, any-

where, including the World Wide Web. Use your favorite applications to publish beautiful, rich, colorful documents fast, with no re-authoring required. And look what you can do down in cold storage. Adobe Acrobat Capture™ literally brings paper documents to life, transforming them into flexible,

fully searchable, graphically complete electronic documents. Imagine what the upper floors can do with that. It's obvious. Adobe Acrobat will help you run it better from the top down. For more information call 1-800-521-1976, Ext. K0459 or visit our web site at <http://www.adobe.com/>.



Adobe, the Adobe logo, Acrobat, the Acrobat logo and Acrobat Capture are trademarks of Adobe Systems Incorporated and may be registered in certain jurisdictions. All other marks and trademarks are the property of their respective companies. © 1995 Adobe Systems Incorporated. All rights reserved.

Enterprise Networking

Vines users seed regrowth of association

New England customers join to restore Banyan liaison

By Laura DiDio
BOSTON

A new Banyan Systems, Inc. Vines user group has taken root in the same Northeastern soil where a predecessor shriveled and died.

The New England Enterprise Vines User Group held its first meeting two months ago. The fledgling organization fills the void left two years ago when the Massachusetts Banyan User Group (MassBUG) disbanded due to lack of support, said Bob Whelan, assistant director of networking at Northeastern University in Boston.

Whelan and a core group of about eight other regional Banyan customers were the driving force behind the new organization. They said they needed a way to get technical updates to regional users between the semiannual Association of Banyan User International (ABUI) meetings.

Plenty of interest

Whelan's contention that there was a "real void left by the dissolution of MassBUG" was proved true by the enthusiastic turnout at the September and October meetings.

More than 50 users from Massachusetts and neighboring

states went to each of the gatherings. Topics discussed included the technical ins and outs of Vines 6.0 and the integration of Vines with Microsoft Corp.'s Windows 95 and Windows NT Client.

"We felt that with technology changing so rapidly, it was a necessity to restart the user group locally," Whelan said. He said networks are getting "more complex by the minute," and quick feedback is a must.

Other users agreed that the new group helps them.

"I'm all for it," said longtime Banyan user Richard Kesner, chief information officer at Babson College in Wellesley, Mass. "ABUI is great. But there are a lot of Vines users in the academic community who can't afford the time off or the money to travel to exotic locales for large user group meetings."

Bill Sheehan, senior technical support specialist at Boston-based Stone and Webster Engineering Corp. and former president of MassBUG, noted the need to exchange technical information is "greater than ever."

"The only people who have a handle on the vagaries of the technology are my fellow network managers who are working in the same trenches I am,"

Sheehan said. He said the first two meetings served as "minitutorials," which were especially valuable because he was able to learn from others' mistakes.

Second time's the charm

Sheehan and Whelan noted that the New England Enterprise Vines User Group won't fall prey to the same pitfalls that

punctured MassBUG.

MassBUG, the users said, died not for lack of interest, but rather because of meeting locations. Many users thought the group was run by the commonwealth of Massachusetts because the meetings were always held in downtown Boston, according to Whelan.

This time around, Whelan, Sheehan and the other six members of the Enterprise Vines Us-

er Group Steering Committee polled the perspective membership during phone conversations on a variety of topics and decided to rotate meetings around suburban campus sites.

The next meeting is slated for Nov. 16 at Analog Devices, Inc.'s headquarters in Norwood, Mass. Anyone interested in attending may contact Whelan at (617) 373-4283 or by electronic mail at rwhelan@neu.edu.

Get the ball rolling

Starting a user group in your area doesn't have to be difficult or costly. Bob Whelan, assistant director of networking at Northeastern University, has the following tips:

- **Contact the vendor.** While vendors probably won't be willing to part with their mailing lists, many, such as Banyan, will be glad to announce the formation of a new user group in their online forums or newsletters.
- **Call prospective attendees.** Poll the potential user group membership to gauge their interest in the group and their preferences for

dates, times, locations and the most pressing topics to be discussed at meetings.

- **Make it relevant.** Once you have determined what the hot issues are, assemble a group of qualified speakers, such as engineers from the vendor or other knowledgeable users who can come prepared to answer technical questions.
- **Get feedback from the meeting.** Poll the membership using written forms at the end of the meeting to see what worked and what didn't.
- **Create an electronic mailing list of the user group.** This will let you send messages, addendums and calls for participation over online services such as the Internet and CompuServe.

—Laura DiDio

Micromuse

CONTINUED FROM PAGE 53

"This provides centralized alarm control for 4,000 devices that form a WAN for more than 10,000 employees," said the corporate network manager. "We tried some other correlation engines, but they were too hard to use or too expensive."

He said Netcool/Omnibus "massages" thousands of alarms gathered by the HP OpenView enterprise management platform from element managers for hubs, routers and WAN links.

Without Netcool/Omnibus and its intelligent filtering, the alarms "would soon fill the console screen," the user said.

The software's default set-

tings and customizable approach can help a management staff eliminate extensive training, said Sylvia Clark, senior an-

Regaining control

Netcool/Omnibus gathers data from diverse management tools to help users deal with numerous and often duplicate alarms from their networks, systems and applications

VERSION 3.0 OFFERS THESE ENHANCEMENTS:

- More supported platforms (SunOS, Solaris, AIX and HP-UX)
- Multithreaded support for multiprocessor servers
- More graphical and Boolean controls on console
- Tenfold performance improvement
- New probe software that gathers more alarms

alist at Aberdeen Group, Inc. in Boston.

A matter of time

Only those organizations with very large, complicated networks need Netcool/Omnibus now, Clark said, but more users will need help weeding out alarms as their networks grow more complicated.

To broaden the tool's appeal to Unix-lexy managers, a version for Microsoft Corp.'s Windows NT is under development, said Mike Silvey, marketing vice president at Dallas-based Micromuse.

Netcool/Omnibus costs \$25,000 for the server with a new SQL-compliant data repository. Probe software kits to gather data cost \$7,500 each, and the client software costs \$7,500 per concurrent operator.

New Product

Security Dynamics Technologies, Inc. has introduced SecurID Key Fob.

According to the Cambridge, Mass., company, SecurID Key Fob is part of a family of network user authentication products that protect and manage access to computer-based information resources. It is a lightweight,

water-resistant token designed for securely accessing networks from environments outside the corporate office.

The product also works in conjunction with Security Dynamics' hardware and software access control products in order to authenticate users' identities. It provides network access to authorized users and locks out hackers and trespassers.

SecurID Key Fob displays a randomly generated access code that changes every 60 seconds. It provides two-factor authentication: The user logs in by entering a personal identification number, followed by the current code displayed on SecurID Key Fob.

Pricing for SecurID Key Fob starts at \$34.

► **Security Dynamics**
(617) 547-7820

Digital

CONTINUED FROM PAGE 53

firewalls. This approach allows Digital, in theory, to say to users, you don't have to replace your firewall, you just have to install [Digital's] tunneling feature," said Tim Sloane, an analyst at Aberdeen Group, Inc. in Boston.

Digital's Group Tunnel will link two or more private networks across the Internet, while its Personal Tunnel will link remote Microsoft Corp. Windows 95 PC users to private networks across the Internet. The software enables Internet servers to authorize user access by name and not just by IP address, which was designed to add security.

The Personal Tunnel software costs \$99. The Group Tun-

nel software costs \$4,995 and was designed for Digital servers running the Digital Unix operating system. Future versions will run on Microsoft's Windows NT, a spokesman said.

Matt Mancuso, manager of information security technologies at the Secure Systems Center of

Computer Sciences Corp., works with businesses setting up computer systems linked to the Internet. He said he will recommend Digital's tunneling products for companies linking branch offices and telecommuters to home office networks via the Internet.

Mancuso said he is worried, however, that tunneling technology in general makes some firewalls too porous. It may allow penetration into areas of a private network the owner did not intend visitors to see.



You've seen performance notebooks with this feature. Or that feature. But everything? Well, complete only begins to describe the Ascentia™ 950N.

First, there's the 120 MHz Intel® Pentium processor. It's all the power

you need to run the most demanding software. Some notebooks are great for memos. This one is capable of something more on the scale of *War and Peace*.

There's also a huge 11.8" Super VGA 800 x 600 resolution screen, in

active-matrix TFT. You'll see 56% more of your document, which cuts down on panning and scrolling. In other words, you'll get the complete picture.

Your projects will sound better, too, with 16-bit Sound Blaster® features and an embedded speaker and microphone. So you can easily take a track off that new CD and drop in a video clip for impressive multimedia presentations.

And since we wouldn't want to disrupt the flow of the next great American novel or the quarterly sales report, there's a long-lasting Lithium Ion battery. Infrared technology for wireless file transfer and printing? Got that, too.

Even the 3-year worldwide warranty* comes with round-the-clock telephone support and our ExeCare™ 48-hour rapid repair service.**



pentium
PROCESSOR

THE COMPLETE PENTIUM NOTEBOOK

Processor:
120, 90 or 75 MHz;
Pentium, 256 KB
Level 2 Cache

RAM:
8 MB expandable
to 40 MB

Screen:
11.8" (Diagonal)
Super VGA 800 x 600
TFT or 10.4" (Diagonal)
VGA TFT

Multimedia:
Sound Blaster
16-bit sound
system

Hard Drives:
500 MB, 800 MB
or 1.2 GB

Battery:
Lithium Ion for
up to 6 hours
Weight:
6.2 pounds

For additional information on the Ascentia 950N's abundant features and a reseller near you, call 800-876-4AST. We can even fax back the information. Yes, we've thought of everything.

AST
COMPUTER

**AT LAST, ALL YOUR FAVORITE
NOTEBOOK FEATURES HAVE BEEN BROUGHT
TOGETHER UNDER ONE COVER.**

Unisys Network Enable.

The one source for the many resources your network requires.

Building a multivendor network is not for the impatient, the easily depressed or the faint of heart. Just ask anyone who's tried to find, choose and manage dozens of vendors themselves.

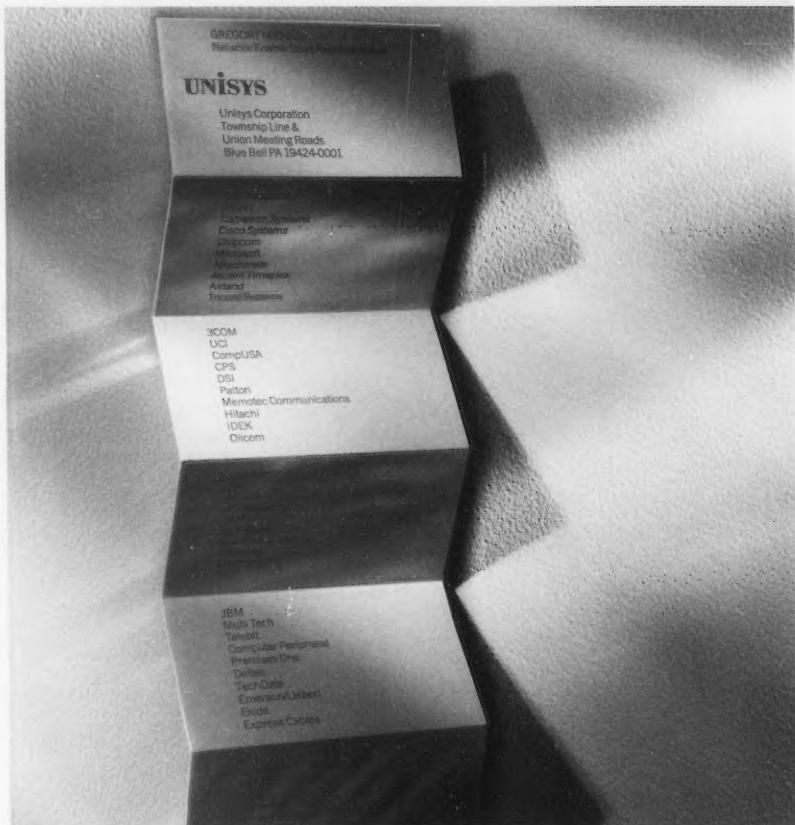
Unisys Network Enable is an easier, more efficient way to solve the problem.

With worldwide depth and expertise, we specialize in designing, installing and maintaining network solutions in multivendor environments.

This means that all you have to do is make one call and we can bring you the best possible solutions, no matter who happens to make them. And that includes over 9,000 products from over 130 vendors.

Besides providing you with the advantages of a single, fully accountable resource, there are many other reasons to call Network Enable.

For example, there's our impressive range of services. These include the creation and support of LANs, WANs and backbone networks. Preinstallation configuring and staging. And Unisys Desktop Services, our premier



enterprisewide support program.

Now that you know Network Enable is the

UNISYS

only name you need to know, there are two things you should do: Get rid of all those other business cards. And contact us today on the Internet at <http://www.unisys.com/adv> or by calling 1-800-874-8647, ext. 134.

Large Systems

HARDWARE • SOFTWARE • CORPORATE STRATEGIES

OLAP vendors at loggerheads

By Dan Richman

Everyone seems intrigued by on-line analytical processing (OLAP), a technology that lets end users scrutinize data with unprecedented thoroughness. But a major schism is forming among vendors over how best to deliver that technology.

One camp comprises vendors of multidimensional database management systems (MDBMSs). MDBMS vendors were the first to popularize the term "OLAP," forming the OLAP Council in Boston to promote this technology and putting their products on the market about two years ago.

These products use their own data stores — often proprietary — into which data must be copied or moved before it can be analyzed. MDBMSs are quick because they use pre-aggregated data, or data that has been summarized or precalculated in some other way.

Another way

An emerging alternative to MDBMSs is what Bob Moran, a senior analyst at Aberdeen Group, Inc. in Boston, has dubbed "relational OLAP" technology that provides multidimensional analysis against data that remains in a relational database management system. This category of OLAP products works with wares from Sybase, Inc., Oracle Corp. and others.

MDBMS-based OLAP products have some limitations. Pre-aggregation limits their query flexibility, and it is widely reported that they bog down approaching 50G bytes. They also lack the security and administration features of major RDBMSs; that limitation becomes more critical as MDBMSs grow in importance in an organization.

Further, MDBMSs require additional training and expertise to set up and administer. They have limited ability to drill down into the data and show end users how a conclusion was reached. And MDBMSs need dedicated tools, although the OLAP Council last week announced a draft specification for an application programming interface that allows tools to access all compliant MDBMSs.

Relational OLAP products have their own set of pluses and minuses. There is no need to copy or move the data into a specialized DBMS, no need for pre-aggregation and no additional administration. They can also use a variety of tools. Sites retain full control over access and security, and the only limit on a database's size is that of the RDBMS.

On the downside, relational OLAP products often run more slowly than MDBMS-based products. Some MDBMS advocates even go so far as to say RDBMSs are inherently, technolo-

DB2's radical redo

IBM updates database to stay in step with the times

By Craig Stedman

Mainframe DB2 is about to shed some of its dowdy legacy trappings and take on a more with-it database look.

IBM's signature relational database will get a major makeover when a long-promised update finally ships late next month. Version 4.0 of DB2 for MVS is a key piece of the computer giant's campaign to dress up System/390 mainframes so they don't look like out-of-place rubes in these client/server times.

The new version adds support for stored procedures and other modern features that until now have been the province of rival databases running on smaller systems. It also lets clustered System/390s share pools of DB2 data; those shared data pools are a key requirement for moving IBM's so-called "parallel sysplex" clustering technology beyond a hardy band of early adopters (see chart).

More is better

The sysplex concept provides a way to spread applications across multiple mainframes to get more raw power and protect against system crashes. Sysplex customers who are beta-testing DB2 Version 4.0 said the data-sharing support allows them to install IBM's new air-cooled 9672 models, which aren't powerful enough yet to take on heavy workloads by themselves.

Toronto Dominion Bank installed the new DB2 release in August and plans later this year to start sharing branch banking data between

Can you relate?

The following new features are included in Version 4.0 of IBM's DB2 for MVS relational database

DATA SHARING

Up to 32 clustered mainframes can share a common pool of DB2 data.

STORED PROCEDURES

A SQL interface lets users create automated series of processing steps.

PARALLEL QUERY PROCESSING

CPU-intensive queries can be split into multiple tasks that run in tandem.

ROW LOCKING

A single row of data is closed during transactions, reducing end-user contention.

CONCURRENT COPY

Backup copies of DB2 databases can be created on the fly with a brief freeze of data.

OUTER JOINS

Nomatching data is automatically combined in query responses, reducing programming burden.

a 10-processor air-cooled system and one of its more expensive water-cooled ES/9000s, said Phil Zita, sysplex project manager at the Toronto-based bank.

"We are heading toward exceeding the capacity of our single [ES/9000s], so we needed to go to horizontal growth instead of vertical growth," Zita said. Data sharing "lets us exploit [air-cooled technology] to get at the cost breaks" that stem from IBM's switch to CMOS

DB2, page 64

Multidimensional OLAP products (Contain their own DBMS)

Vendor	Product
Kenan Technologies Cambridge, Mass.	Acumate ES
Arbor Software Sunnyvale, Calif.	Essbase
Oracle Redwood Shores, Calif. (through IRI Software)	Express
Holistic Systems Edison, N.J.	Holos
Dun & Bradstreet Software Framingham, Mass.	Pilot

The Great Divide

Relational OLAP products (Run against major relational DBM)

Vendor	Product
Information Advantage Minnetonka, Minn.	Axsys
Prodea Software Eden Prairie, Minn.	Beacon
Microstrategy Vienna, Va.	DSS Agent
Stanford Technology San Francisco	Metacube
Sagent Technology Menlo Park, Calif.	Product not yet named

What is OLAP?

On-line analytical processing is a data analysis technology that does the following:

- Presents a multidimensional, logical view of data to the end user with no requirements as to how the data is stored.
- Sorts, forecasts, tracks trends and performs other complex analyses.
- Lets users move from one query to another and get results quickly and easily.

A query that doesn't require OLAP is "How many shoes did we sell last month?" One that does is "How many size 10 shoes in red did we sell last month in the Midwest, the Northwest and the Southeast, compared with that same month last year, actual vs. budget?"

The above definition comes from the OLAP Council, a vendor group in Boston. Another, far more complex, definition is available from database theorist E. F. Codd; it contains 12 criteria for a technology to be considered OLAP [CW, July 26, 1993]. —Dan Richman

WHAT A
CHARMING
HODGEPODGE
OF SERVERS, PC'S
AND MAINFRAMES
YOU'VE GOT
THERE.

(MAY WE SUGGEST THE UNIX® SYSTEM
THAT'S BEEN SHOWN TO MANAGE
MULTIVENDOR ENVIRONMENTS BEST?)

It's as if you've inherited computers from at least three different dynasties. They're all different sizes, shapes and capacities, and sometimes they don't seem to like each other very much. On the other hand, you really need them to get along.

Which is why, at the recent Enterprise Management Summit, the RISC System/6000® and other UNIX systems were put through 14 grueling tests on managing complex multivendor environments. When the dust settled, only one company was able to outperform HP®, Groupe Bull®, Computer Associates® and Digital®. And that company is IBM.

According to independent computer consultant D.H. Brown, IBM's AIX® is the best-rated UNIX operating system.* And when you also have SystemView® for AIX monitoring as well as managing complex networks,

your system will easily be able to grow right along with your business, without having to increase the size of your staff.

It will also be possible for you to keep track of your network without leaving your desk, because SystemView for AIX provides all the systems management functions under one easy-to-use interface. Tasks like job scheduling, distribution, network management, back-up and remote systems configuration can be performed in a faster and more efficient way.

For more information on how to turn a legacy of other people's computers into a very big asset for you, call us at 1 800 IBM-3333, ext. FA180. Of course, if you're on the Net, you may want to pay a visit to our home page at <http://www.austin.ibm.com>

IBM

Solutions for a small planet™



Large Systems

Start-up hopes for room in reporting tool market

By Dan Richman

A 2-year-old Silicon Valley start-up is betting there is room for its forthcoming reporting products even in a market crammed with 25 competitors.

Actuate Software Corp. said its suite of six reporting tools differs from competing products — particularly SQR Workbench from Management Information Technology, Inc. in Long Beach, Calif., and Focus from Information Builders, Inc. in New York — in two ways.

One difference is a small database accompanying each report that allows users to analyze the data it contains. That isn't possible with conventional, static reports. The second difference is that after information systems personnel or power users construct reports, end users can break apart their functional components and reassemble them to fit their changing needs.

These are genuine distinctions, even in a crowded market,

users and analysts said.

"I was extremely impressed by the technology. It was better and different than other products of the same type that I've seen. The real constraint is how quickly they can get it out there and who they can attract as partners," said Hugh Bishop, director of emerging technologies research at Aberdeen Group, Inc. in Boston.

"So far as I know, there's nothing else out there that provides production reporting on a large enough scale to accommodate an entire organization but also includes hypertext capabilities and other client/server niceties," said Craig Johnson, a manager of technology planning and development at Kaiser Permanente Health Plan, Inc., a health maintenance organization. Kaiser Permanente is evaluating Actuate's wares.

By year's end, Actuate will ship three products: Developer Workbench (\$1,999), which will enable developers to create

functional components called Report Objects in a dialect of Basic; End-User Desktop (\$199), which end users can use to create ad hoc queries; and Viewer (free), which end users can use to access data with Report Objects.

The company will deliver by April 1 its End-User Workbench (\$599), which lets power users customize Report Objects; Report Server (\$1,500 and up), which puts Report Objects on a network; and Administrator Desktop (\$599), the user interface to Report Server.

Actuate's products can run under Windows or in a client/server configuration with Windows clients and a server running under Hewlett-Packard Co.'s HP-UX, IBM's AIX, Sun Microsystems, Inc.'s Solaris or SPARC or Microsoft Corp.'s Windows NT. The products natively access data in Sybase, Oracle, Informix and Microsoft SQL Server and offer Open Database Connectivity access.

Briefs

IBM leasing extended

IBM Credit Corp. has extended to year's end a special financing and upgrade program for buyers of the company's AS/400 Advanced Series midrange systems. The Advanced Power Lease program was scheduled to expire Sept. 30. The program offers interest rates as low as 4.9% and a new 90-day deferral of first payments. It also includes an option to upgrade to IBM's new 64-bit RISC AS/400 models without changing payment terms.

Warehouse trio teams

Informix Software, Inc., KPMG Peat Marwick and Digital Equipment Corp. will cooperate on a data warehouse product and services offering. The effort will use 64-bit addressing for large Informix relational databases.

BMC takes legal action

BMC Software, Inc. in Houston has filed a lawsuit in a Texas county court seeking to

prevent seven former workers from using its technology in products being developed by their new employer, Peregrine Systems, Inc. in Carlsbad, Calif. Peregrine is headed by John Moores, a co-founder and former chairman of BMC. Moores, who left BMC in 1992, isn't a target of the suit.

Sony shows jukebox

Sony Electronics, Inc. in San Jose, Calif., last week introduced a high-performance, rewritable optical disc jukebox. The OSL-6000 has 460 platters and provides 78G bytes of storage. The product is slated to ship by the end of October at list prices of \$17,500 for a two-drive unit and \$23,000 for a four-drive unit.

Software team forms

Boole & Babbage, Inc. in San Jose, Calif., and Peregrine Systems, Inc. in Carlsbad, Calif., has announced a partnership to integrate Boole & Babbage's Command/Post systems management software with Peregrine's ServiceCenter help desk software. A common interface be-

tween the two products allows enterprise-wide alarms and alerts to be directed to a central help desk.

HDS moves into PCs

Striking out beyond the mainframe market, Hitachi Data Systems Corp. recently introduced its first disk and tape storage devices for Unix systems and PC LANs. The Santa Clara, Calif., company announced the HDS 5700 disk array, which supports up to 336G bytes of capacity; the HDS 5400 tape subsystem; and a HILANDER LAN backup device. HDS is trying to set up a network of resellers to handle most sales of the SCSI-based devices.

Borg honored

The Association for Women in Computing has presented its 1995 August Ada Lovelace Award for Excellence to Anita Borg at its annual meeting in Reno, Nev. Borg, an internationally recognized expert on computer operating systems, is a consultant engineer at Digital Equipment Corp.'s Network Systems Laboratory in Palo Alto, Calif.

OLAP vendors at loggerheads

CONTINUED FROM PAGE 61

choices.

"We chose Beacon from Prodata [Software Corp.] because it will go against any database we want, even [Microsoft Corp.'s] FoxPro," said Jerry Colfer, director of sales technology at Johnson & Johnson in New Brunswick, N.J.

"I've heard the arguments in favor of a unified front end and MDBMS, but I haven't seen anything to support their higher-performance claim."

Eric Klusman, a vice president at Cantor Fitzgerald Securities in New York, praised Arbor Software Corp.'s Essbase MDBMS as efficient and quick and said he isn't sure he could get similar performance from relational OLAP.

There is no clear difference in cost between the two camps, and there are plenty of details that make product comparisons. So how to choose?

As if it weren't already difficult, within the next year or so major RDBMS vendors will likely integrate OLAP capabilities into their products. Oracle this summer bought IRI Software in Waltham, Mass., which sells an MDBMS-based product. It is unclear how that will be integrated with Oracle's RDBMS.

Informix Corp.'s path is clearer. Sources say it is expected soon to acquire the Stanford Technology Group in San Francisco, which produces a relational OLAP product called Metacube.

Users may be able to have the best of both worlds. Moran suggests using MDBMSs for compute-intensive queries such as what-if scenarios and using relational OLAP for "browsing" data in more conventional decision-support environments. Moran said he believes the role of MDBMSs in the future may be limited. He added that relational OLAP likely will become the more mainstream technology.

Decision time

There is no clear difference in cost between the two camps, and there are plenty of details that make product comparisons difficult. So how to choose?

DB2 gets radical overhaul

CONTINUED FROM PAGE 61

microprocessors, he added.

Southern California Edison Co. in Rosemead, Calif., also will start using the data-sharing capabilities late this year in a system combining two 9672 machines with an ES/9000. The machines will run a new DB2-based customer service application that couldn't fit on a single system, said Mike Sigal, DB2 database and strategy planning consultant at the utility.

On par with Unix

Stored procedures and the other new features that put Version 4.0 on a more functional par with Unix databases also should make working with DB2 easier and more productive, Sigal said. "There's a lot of things in there that our application developers have been looking for," he said.

"Version 4.0 gives us a completely new set of tools to work with," said Carl Gerberich, vice president of information services at Marist College in Poughkeepsie, N.Y.

Storing strings of database procedures in DB2 will reduce the need for client-level coding, and the ability to break up queries into parallel tasks should help speed processing, Gerberich said.

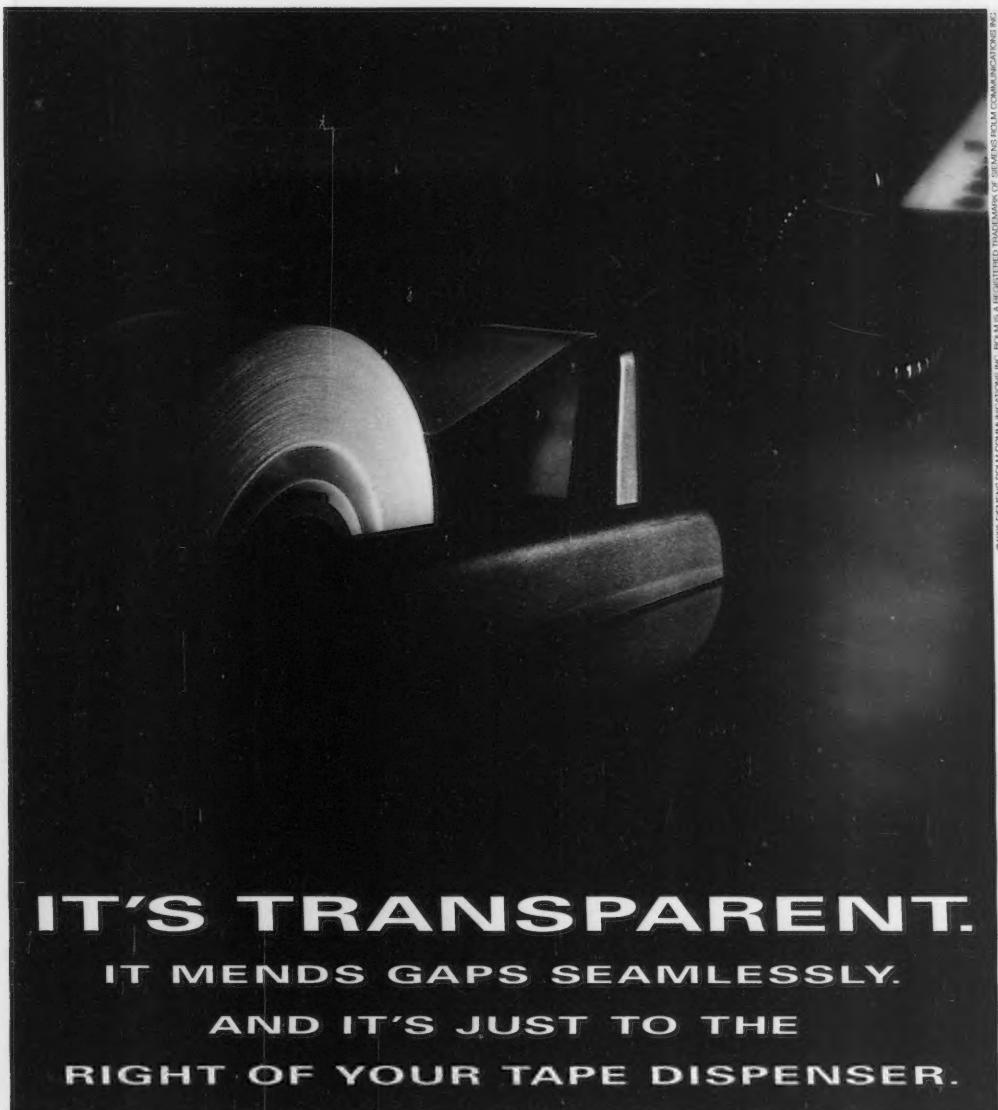
Marist, which has a single mainframe, began implementing DB2 in September for an application that lets faculty members use video in their teaching. The college is using an earlier release of DB2 but will go to Version 4.0 as soon as IBM tests the database with its digital library products, Gerberich said.

The data sharing and parallel querying enabled by DB2 Version 4.0 gives IBM "a mammoth server capability" that makes System/390s more amenable platforms for data warehousing and other decision-support applications, said John Young, an analyst at the Clipper Group, Inc., a consultancy in Wellesley, Mass.

But IBM must overturn the perception that warehousing data on a mainframe "just isn't cool," Young added.

SIEMENS

ROLM Communications



© 1995 SIEMENS ROLM COMMUNICATIONS INC. ROLM is a registered trademark of SIEMENS ROLM COMMUNICATIONS INC.

**IT'S TRANSPARENT.
IT MENDS GAPS SEAMLESSLY.
AND IT'S JUST TO THE
RIGHT OF YOUR TAPE DISPENSER.**

The traditional office as we know it is coming apart at the seams. Sales teams are on the road. Managers are working off-site. And more and more of the workforce is telecommuting. But with ROLM virtual office solutions, this transition can be transparent. ROLM virtual office solutions break down the barriers of time, distance and information access. So your employees work together and respond to customer needs no matter

**ROLM RESULTS:
BRINGING
WORKGROUPS
TOGETHER**

where they are. From intelligent voice mail that can place calls to employees on their car phones to wireless capabilities and worldwide fax, we can help your team reach new heights of teamwork. Call for our white paper on how we can break down the walls to create the virtual office and improve your information infrastructure. Not to mention how to close the gap between where you are and where you want to be.

YOUR PHONE SYSTEM. IT COULD BE THE MOST POWERFUL TOOL IN YOUR COMPANY.

FOR MORE INFORMATION, GIVE US A CALL AT 1-800-ROLM-123, EXT. 34.

Informix's Phil White on AT&T WorldMark Servers.

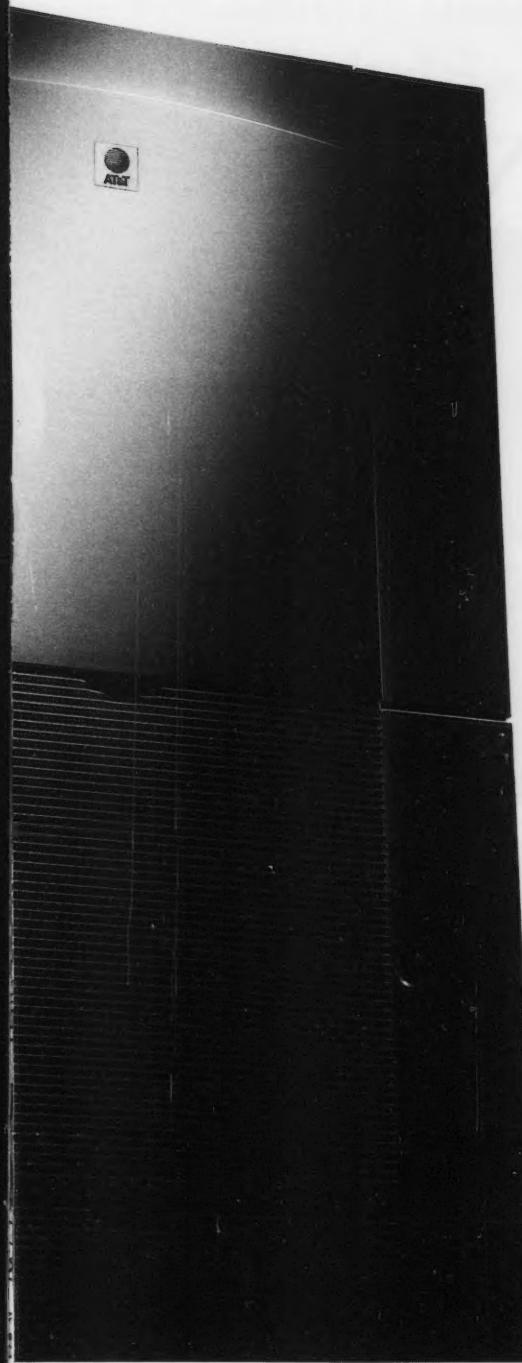
We make the most scalable database in the world.

No platform scales us better than AT&T."

Phil White, CEO, Informix Software



Informix is a registered trademark of the Informix Corporation. AT&T 5100S shown features Intel Pentium processors. The Intel Inside and Pentium Processor logos are trademarks of Intel Corporation.



At AT&T, we're committed to making sure all the applications you need are optimized for our AT&T WorldMark Servers. That's why we've developed an alliance with a leading database provider like Informix.



Whether you're running uniprocessors, SMP, clusters, or MPP, nobody can afford a database that doesn't scale. That's why so many businesses are using Informix's Dynamic Scalable Architecture™ to power their OLTP, batch processing, and data warehousing applications. And the server that has the scalability to match Informix's scalability processor for processor? AT&T WorldMark Servers. The perfect platform for all your enterprise apps.

To get more info about AT&T WorldMark Servers, call 1 800 447-1124, ext. 1130. E-mail us at attgis.info@daytonoh.attgis.com or visit our web site at <http://www.attgis.com/events/WorldMark>



AT&T
Global Information
Solutions



With a team like this, it's easy to see how applications scale up to the enterprise.



Our team is on your side.

The news is out. Microsoft® and Gupta® have teamed up to deliver all the power you need to build large-scale, component-based client/server applications. And do it quicker than ever before.

All the power you need.

Together, Microsoft and Gupta have optimized SQLWindows® and SQL Server 6® to enable developers to build large, robust applications that include optimized connectivity, a powerful team repository, and a fast 4GL-to-C compiler.

Quickly build forms, flesh out user interfaces, access multiple databases, even integrate with Microsoft Mail, all without writing a single line of code!

The secret? SQL Windows' QuickObjects, a rich collection of pre-built components that simplify programming and are OLE2 compatible. Now powerful applications are easier to assemble, easier to finish.

Components for multiple databases.

SQLWindows is also optimized for Oracle®, Sybase®, Informix®, Ingres®, DB2® and AS/400®.

The best news of all? Visual Basic® users benefit from the deployment components that over 100,000 SQLWindows developers have relied on for a decade. Like SQLNetwork's three-tier connectivity from Visual Basic to DB2 or legacy data. And SQLBase Desktop includes Visual Basic components for easy SQL access.

Join the team that scales the enterprise.

A team like this is too tough to beat. The ease of Microsoft and the robust power of Gupta. Call **1-800-44-GUPTA Ext. 404** today for a free Microsoft/Gupta information kit.



GUPTA™

THE POWER TO GET
CLIENT/SERVER DONE.

Gupta on Internet <http://www.gupta.com>

©1995 Gupta Corporation • 1060 Marsh Road, Menlo Park, CA 94025 • 415/321-9500 • Fax: 415/321-5471 • Quest, SQLBase, SQLGateway, SQLRouter, SQLHost and SQLTalk are registered trademarks of Gupta Corporation. SQL/API, SQLNetwork, SQLConsole, QuickObjects, Fast Facts, Gupta and the Gupta Powered logo are trademarks of Gupta Corporation. SQLWindows is a registered trademark and TeamWindows, ReportWindows and EditWindows are trademarks exclusively used and licensed by Gupta Corporation. Windows is a registered trademark of Microsoft Corporation. Other trademarks are the property of their respective owners.

NEW SMALLTALK VERSION
EASES DEVELOPERS' WOES
WITH LARGE APPS, 72
NEW PRODUCTS, 72

Application Development

CASE • LANGUAGES • TOOLS

C++ slowly makes the grade in IS shops

By Frank Hayes

Can C++ make it in corporate information systems?

The object-oriented language based on C has gained a foothold in industries noted for using leading-edge technology, such as financial and telecommunications companies. But its use isn't nearly as widespread as Cobol, PL/I or other IS standards.

C++ has a reputation for encouraging programmers to write code that is hard to understand and maintain. Critics say the language lacks features that corporate developers need. For example, Cobol includes built-in features for database access, while C++ requires additional code libraries to perform those functions.

Fad or not?

While C++ is used in 20% of the large corporate development shops recently surveyed by Forrester Research, Inc. in Cambridge, Mass., others still dismiss it as a passing fad.

"Our MIS department doesn't know the first thing about C++," said Jim Cash, general manager for technical services at Co-Steel Raritan, Inc. in Perth Amboy, N.J. "The only thing they know is that it's the third letter of the alphabet."

Nor is C++ universally embraced among financial organizations. "We've looked at object-oriented languages, but this stuff just isn't ready for prime time," said one developer at a Chicago bank.

Even so, there are signs that C++ is making headway, even among the most traditional IS organizations.

"When we recently asked [50 large organizations] what their top general development tools are, we got the usual suspects, like PowerBuilder, Visual Basic and Cobol. But there were also about a dozen people who mentioned C++," said Rick O'Herron, a research associate at Forrester's software strategies service.

In part, that is because vendors are answering complaints about the shortcomings of C++. Improved C++ class libraries now provide many of the database and transaction features that IS departments need for their applications, and some C++ development systems now

feature visual rapid-development environments.

To make C++ more appealing to corporate developers, two vendors recently announced the following:

- ProtoView Development Corp. in Cranbury, N.J., next month will begin shipping ProtoGen+ 5.0, a graphical rapid-development environment that generates C++ instead of an interpreted scripting language. The tool set, which runs on Microsoft Corp.'s Windows 3.1, Windows 95 and Windows NT, costs \$1,999.
- Rational Software Corp. in Santa Clara, Calif., next month will roll out Rational Apex C/C++, a structured environment for C++ development. The Apex environment, which can link to Rational's Rose object-oriented design system, runs under Unix and starts at \$7,500.

Even the strongest supporters of C++ recognize that experienced Cobol programmers are in much greater supply than C++ developers. "It's not [like] there are 70 million people who can write code in C++," said Vimal Chowdhry, chief financial officer at Mount Clemens General Hospital in Mount Clemens, Mich.

Productivity gains doubtful

Yet another problem for C++ is that, while it is a powerful language for building client/server applications for Macintoshes and Windows-based PCs, it is still just another language that isn't likely to dramatically boost programmer productivity.

Mainframe programmers don't want to learn assembler all over again," said Mark Simons, vice president of operations at Integrated Software Solutions, Inc. in Ellicott City, Md. As a result, many IS shops are building Windows-based applications using visual rapid-development tools such as Powersoft Corp.'s C++, page 72

@ Talkback@cw.com

Do you think C++ is ready for prime time? Is it used at your workplace? What does C++ need to make it something you would use? Sound off to us at Talkback@cw.com. Please include your full name. We will publish a sampling of reader opinions in an upcoming issue.



Cmdr. J. R. Kennedy (left) and Deputy Frank Baker of the Hillsborough County Sheriff's Office in Tampa, Fla. Kennedy and his team of 10 programmers design applications to improve crime fighting and save money.

Sheriff's office fights crime with help from Mapper tool

By Neal Weinberg

Successful crime fighting takes street smarts, intuition and plenty of legwork. At the Hillsborough County Sheriff's Office, it also takes Mapper, the venerable Unisys Corp. application development tool.

J. R. Kennedy, commander of data operations at the 900-deputy, Tampa, Fla.-based sheriff's office, has a SWAT team of 10 programmers who write between 10 and 15 applications a year using Mapper.

According to analysts, Mapper hasn't made much of a dent outside Unisys' installed base. But users such as Kennedy, who has a Unisys mainframe, say Mapper is just the ticket.

Beginner jitters

Kennedy said when he came on board in 1990, he was unfamiliar with and skeptical of Mapper. But over the years, he has become a convert.

"Newer things have the bells and whistles, but the Unisys stuff keeps working and working," said Sandy Taylor, an analyst at The Standish Group International, Inc. in Dennis, Mass.

Col. Daron Diecidue, who heads administration support services, said Mapper has developed such a strong track record that there are

currently 40 requests for new programs. One of Diecidue's duties is to select the 10 to 15 top priorities for the development team to attack in any given year. Those include everything from a new payroll system to keeping track of the 2,000 civil papers served every month. "People want more and more," he said.

But is it beneficial?

In terms of measuring the cost benefits, Diecidue said it is difficult to put a dollar figure on people the department doesn't have to hire or time saved in the crime fighting process. But he said using Mapper-based programs has become "a way of life" for the sheriff's deputies.

And that permeates just about every aspect of the department. Kennedy has taken incident reports, fingerprints, mug shots and other crime-related information and put together systems aimed at making life easier for the cop on the beat.

For example, when a 911 call comes in, a computer-aided dispatch system that eliminates the need for 26 additional dispatchers, saving \$3.1 million annually. And an electronic incident report system that handles 125,000 documents a year, saving \$145,000 a year.

Mapper, page 72

No, I didn't get lunch. Or dinner. All I got was 13 hours with a pile of documents, each with its own set of editorial comments. Which meant I had to coordinate hundreds of comments on a dozen plans that had now become a rainbow of highlighter marks and chicken

Why the only thing I had to eat today was a week-old, slightly linty sourball.

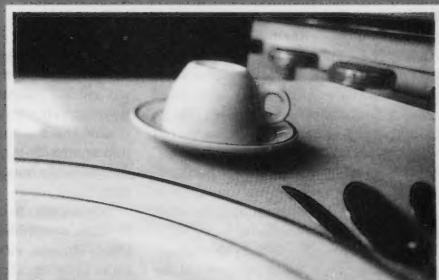
scratches I could hardly read let alone agree with. So there I sat, page by page, plan by

plan, muttering things under my breath while time

passed and the sun went down and the cleaning guy

packed up his floor polisher and went home, while I sat at my desk looking frantically

for those sourballs I had in my sportcoat pocket. Because a guy's gotta eat, you know?



IMPROVE THE WAY EVERYONE WORKS.



Word Pro 96 has team features that make it easy to share ideas, collaborate, and work together. No other word processor does this.



TeamReview™ makes it easy to get input from the right people. **TeamConsolidate™** quickly combines all of the best ideas into one, single document.



Smart Word Processing tools. Powerful, intuitive tools to breeze through everyday word processing tasks and get great-looking output.



Divider Tabs help you organize and navigate long documents. Top-notch filters bring in all your files—a key part of *Lotus Word Pro*.

Introducing Lotus Word Pro 96, part of the new SmartSuite. The first word processor designed for teams, Word Pro™ is just one of five important desktop tools, including Lotus 1-2-3®, Freelance Graphics®, Approach® and Organizer® that make you and your team more productive. With the highest level of integration, especially with Lotus Notes.® SmartSuite® is available for Windows® 95, Windows 3.1 and soon for OS/2.® All for as little as \$199.* For more information, reach us at 1-800-TRADE-UP, ext. B250. Or on the World Wide Web at www.lotus.com.

Lotus
Working Together

In Canada call 1-800-GO-LOTUS. *Upgrade only. ©1995 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, Working Together, Lotus Notes, Lotus SmartSuite, Approach, Freelance Graphics, 1-2-3 and Lotus Organizer are registered trademarks and Word Pro, TeamReview, SmartMasters, and TeamConsolidate are trademarks of Lotus Development Corporation. Windows is a registered trademark of Microsoft Corp., and OS/2 is a registered trademark of IBM Corp.

Application Development

Latest Smalltalk version eases developers' woes with large apps

By Frank Hayes

Smalltalk applications are big with corporate developers — and that's a problem.

Smalltalk is gaining popularity in information systems departments because it lets developers produce applications faster than with other object-oriented languages such as C++, users say. But Smalltalk also tends to generate much larger applications than C++, and it generates them as single, big programs that require significant amounts of memory and disk space.

And deploying those big Smalltalk applications can be a real challenge.

"You can't just distribute a 12M-byte client [program] to all the systems on a network very easily," said Matt Rosen, assistant director of technical services at San Joaquin Delta College in Stockton, Calif.

Hoping to ease that problem, Smalltalk vendor ParcPlace-Digital, Inc. in Sunnyvale, Calif., has rolled out a new version of its VisualWorks Smalltalk development system. VisualWorks 2.5 lets developers break an application into a set

of smaller components. That removes a major stumbling block for corporate developers, making it much easier to slim down fat clients, users said.

With the release, developers can leave out unneeded features from Smalltalk applications. For example, if only Windows-based PCs are used as client systems, developers can remove support for Macintosh and Unix user interfaces, making the code smaller, said John Shoun, an IS adviser at Nortel, Inc.'s object technology center in Research Triangle Park, N.C.

And when it is time to distribute enhancements and bug fixes, developers can choose to change only the individual components that are affected.

"You don't have to deploy the application as a single large image. That really simplifies updates," Shoun said.

VisualWorks 2.5 also adds support for foreign languages as well as improved performance with Oracle Corp., Sybase, Inc. and IBM DB2 databases.

The new release, which is shipping now, costs \$2,995 on PCs and Macintoshes and \$4,995 on Unix platforms.

But while Smalltalk is becoming increasingly popular, corporate developers are still more likely to view C++ as their top object-oriented tool, according to Forrester Research, Inc. in Cambridge, Mass. Smalltalk still has some limitations, users said.

One remaining problem is that Smalltalk systems still don't make it easy enough to develop distributed applications.

"It's a little clumsier than you'd hope it would be with objects on both ends," Rosen said.

Another difficulty is that unlike C++, which compiles to executable code, Smalltalk is interpreted, much like Powersoft Corp.'s PowerBuilder or Microsoft Corp.'s Visual Basic.

"The performance could be better," Rosen said. "But the rapid development we get with Smalltalk is more important to us than the performance we lose."

C++ is typically used in system-level work, while Smalltalk is used for business applications.

C++

CONTINUED FROM PAGE 69

PowerBuilder and Microsoft's Visual Basic, he said.

Still, C++ is gradually being accepted in corporate development shops. The biggest factor behind this simply may be that these shops are learning how to use object-oriented languages such as C++, Object Cobol and Smalltalk.

"Some of the C++ products give you a good baseline, a good jump-starting point with object classes to get moving with," said Bill Noffsinger, application development manager at the University of Florida at Gainesville.

But a year ago, development was focused almost completely on Cobol, he said. Today, the university uses some C++ and Cobol.

"I think IS organizations as a group aren't quite as anxious about C++ as they were a couple years ago," Noffsinger added. "It's not quite as verboten as it was before."

Mapper

CONTINUED FROM PAGE 69

If a suspect is arrested, a color photograph is taken and added to a database of 450,000 mug shots. Deputies and witnesses to crimes can access the photo database and conduct queries based on physical characteristics.

In addition, fingerprints are sent to a special shop that can match a suspect's prints with others on file. This procedure is useful if the suspect uses a phony name or is wanted for other crimes, Kennedy said.

Keeping track

There is also a master name index that keeps track of every contact an individual has with the department, a database of stolen vehicles and a mapping system that lets investigators plot the locations of recent burglaries, for example.

Kennedy developed an electronic-mail system that lets deputies message one another on mobile digital terminals be-

cause officers who work different shifts in the same geographic area need a way to pass on updates. The sheriff's office also operates the county jail, and Kennedy worked out tracking systems that keep an eye on everything from supplies to the whereabouts of prisoners on an hourly basis.

Ready and willing

Police officers aren't required to come in and do database searches, Kennedy explained, but his staff of developers are waiting to help. And deputies who routinely use the system quickly become proficient, he said.

In some aspects of his operation, Kennedy uses the latest technology. He has a frame-relay network connecting 12 locations, from substations to three different jails. He plans to install an Asynchronous Transfer Mode switch.

But for application development, he is sticking with Mapper.

"It's so old, people don't think about it," he said. "But it works very well."

New Products

Talarian Corp. has introduced SmartSockets, a message-oriented toolkit.

According to the Mountain View, Calif., company, SmartSockets is a middleware tool kit for interprocess communications and was designed for developers working on internal projects.

SmartSockets handles network interfaces and communications protocols, guaranteeing delivery of messages and managing recovery after network problems. It includes tools for developing, testing and controlling all of the programs that can be involved in a networked application.

SmartSockets features visual interprocess communications monitoring and publish-subscribe communications. It also includes automatic data conversion, an object-oriented application programming interface, a C++ class library and debugging tools.

Pricing for SmartSockets starts at \$3,000.

► **Talarian**
(415) 965-8050

Datageneration, Inc. has introduced Generator 3.0, a cross-platform tool for creating design, test and production data for application programmers and database developers.

According to the Cape Elizabeth, Maine, company, Generator 3.0 reduces hours of data input and programming by automatically creating millions of data records. Users define any type of data value and select a data file type, creating a data file to populate and test applications.

Generator 3.0 includes 23 data file types and new field and record delimiters. It includes a messaging manager for interprocess communication of generation events, with timing estimations and runtime duration messages for sample and production runs.

Generator 3.0 costs \$189.
► **Datageneration**
(207) 767-0665

Responsive Software, Inc. has introduced ZipTitle.

According to the Berkeley, Calif., company, ZipTitle lets software developers include a Title Shield on applications. Users create a bit map for their product's Title Shield, or use a stock photo, and call a ZipTitle function to display the shield during the initialization phase

of the application. ZipTitle performs the bit-map transfers, displays version information, responds to errors during start-up and synchronizes multiple windows. ZipTitle also lets developers use 256-bit color images for title shields.

ZipTitle costs \$49.

► **Responsive Software**
(510) 843-1034

Bytech Business Systems, Inc. has rolled out PrintWorks, a custom control for Microsoft Corp.'s Visual Basic.

According to the Pomona, N.Y., company, PrintWorks lets users create, preview and print documents of any kind. One line of code launches a built-in preview window for screen display and printing.

This preview window lets users zoom in or out, scroll and print pages. It uses a Windows Dynamic Link Library written in C++ to process documents. It was designed to save time programming code; one line of code can format an entire paragraph.

PrintWorks creates output by drawing it, not by using graphics controls or executing a form print, which can drain resources.

PrintWorks costs \$149.
► **Bytech Business Systems**
(914) 354-8666

Interactive Development Environments, Inc. has introduced STP/OMT Toolkit, a code-generation tool set designed for large development teams.

According to the San Francisco company, STP/OMT Toolkit is an object-oriented analysis, design and code-generation tool set. This latest version of the tool kit includes groupware tools that support large team collaboration, including a feature that automatically maintains real-time, enterprise-wide consistency of objects and object models.

STP/OMT Toolkit features a messaging system that works across a network to notify developers of updates and includes a multiuser object model repository, which lets multiple developers simultaneously view, edit and update object models.

The product has a collaboration window that lets multiple remote developers collaborate on designs and reviews while viewing the same evolving model through videoconferencing.

STP/OMT Toolkit costs \$12,000.
► **Interactive Development Environments**
(415) 543-0900



THE ROAD TO DATA WAREHOUSING SUCCESS IS PAVED WITH THE SAS® SYSTEM.

SOFTWARE WITH EVERYTHING YOU NEED TO MANAGE, ORGANIZE, AND EXPLOIT A DATA WAREHOUSE

As the only provider of a complete end-to-end data warehousing solution, SAS Institute is with you at every turn, including:

THE BACK END: ACCESSING CORPORATE DATA

The first step in building a data warehouse is accessing operational data from wherever it resides, and in whatever format. The SAS System provides a powerful 4GL coupled with access methods that tap directly into a variety of legacy databases. More than 50 different data structures across more than 15 diverse computing environments, from PC files on the desktop to DB2® on the mainframe.

MANAGING THE DATA: PREPARING FOR BUSINESS ANALYSIS

Once accessed, data must be transformed into a consistent, integrated form. The SAS System cleans, reconciles, de-normalizes, and summarizes data. Then, it loads data into logical views that can be surfaced into a variety of analytical and reporting applications.

THE FRONT END: EXPLOITING THE DATA

Once data arrive in the warehouse, an arsenal of capabilities is available for querying, analyzing, and reporting on that data. These tools include

OLAP/multidimensional analysis, data visualization, information and presentation graphics, forecasting, operations research, financial management, and more.

PLUS A FREE CHECKLIST TO GUIDE YOU



Building a successful data warehouse requires careful planning. Luckily, information managers everywhere can have the facts at their fingertips with SAS Institute's *Checklist for Data Warehousing Success*. We've included practical tips for approaching data warehousing from corporate, business, and IT perspectives.

To receive your free *Checklist*, give us a call or send us e-mail at ccw@sas.com



SAS Institute Inc.
Phone 919-677-8200
Fax 919-677-4444
World Wide Web: <http://www.sas.com/>
In Canada: 1-800-363-8397

SAS is a registered trademark of SAS Institute Inc.
Copyright © 1995 by SAS Institute Inc.

If if a a critical critical

hardware hardware component component

in in your your storage storage

system system fails fails,, will will

there there be be a a backup backup??

With backup after backup in IBM RAMAC, the answer is a resounding yes yes.

In the event of an actual emergency, it's quite comforting that the RAMAC™ Array Family of disk storage systems provides multiple levels of hardware backup to help keep your data safe and available. In fact, its data availability is the best of any DASD storage system.

For instance, RAMAC has redundant power and cooling systems.

Can your storage system do this?
If one fails, the other keeps running. If the power goes out entirely, a battery in each drawer enables data in cache to be written onto disk so it's not lost.

Even when things aren't life-threatening, the RAMAC Array keeps copies of data in both a cache and nonvolatile storage, protecting your data from cache failures.

At another level, self-diagnosis corrects problems automatically or alerts you and IBM if something needs attention. Even then, most parts can be changed and data recovered without taking you offline.

RAMAC then goes further with RAID 5 protection. RAID 5 saves data across multiple drives. If one fails, data is regenerated, without interrupting your applications. RAMAC is also the only system with a tri-level cache. It offsets the performance penalty once associated with RAID 5 protection.

Behind all this fault-tolerant technology are backups of the human kind. Namely,

a worldwide network of storage experts.

Protection like this is why RAMAC is the fastest-selling new high-end storage system in history. And now with special leasing options, IBM can protect your future as well, making it easy to upgrade to future technologies when they're available. Call 1 800 IBM-3333, ext. QAl01, or visit our Internet

site at <http://www.storage.ibm.com/storage> for more (but not redundant) information.



IBM

Solutions for a small planet™



If he used our software, he'd be even more flexible.

Let's face it, with reengineering mandates coming out practically daily, it's impossible to be too flexible. Dun & Bradstreet Software's SmartStream® client/server applications feature decision support capabilities and built-in configurable workflow that not only energize your existing business environment, but adapt quickly as your needs change. Call us at 1-800-290-7374, ext. 960, or reach us on the Internet at solutions@dbsoftware.com.

Dun & Bradstreet Software

FINANCIALS HUMAN RESOURCES MANUFACTURING DECISION SUPPORT

©1995 Dun & Bradstreet Software Services, Inc.

Management

Inside

VINCE BARABBA'S
MEETING OF THE MINDS, page 84
CALENDAR, page 89

Giant home center retailers must deliver know-how with their vast inventories. But is information technology . . .

the right tool for the job?



Richard Nawrot, senior vice president of IT at Payless Cashways, says his chain's information-intensive service efforts might benefit from technology

By Brian McWilliams

With their broad interiors, low prices and vast selection, home improvement centers such as The Home Depot, Inc. appear to follow the strategy of Wal-Mart Stores, Inc., Costco Wholesale Corp., BJ's Wholesale Club, Inc. and other warehouse-format retailers.

But these home centers, which cater heavily to do-it-yourselfers, face a different challenge than other brightly lit repositories for commodity products.

"We bundle what we sell with know-how. In a lot of ways, we're in the service business," says Ron Griffin, chief information officer at The Home Depot in Atlanta. That means The Home Depot, the market leader with sales of \$12.4 billion last year, needs to give its customers a lot of information.

While information systems managers across the home center segment share that view, they don't agree on the role information technology should play in delivering such customer service. On page 80, technology proponents and skeptics have their say.

There are two
history making software
launches this year.

(Ours is the one without
the \$200 million ad budget, the
British rock band and
the 70 million potential users.)

Shucks.

Introducing Huron® ObjectStar™ 3.0. Now, moving business-critical applications off the mainframe to client/server is no longer a bad career move.

At Antares Alliance Group we, too, have a new product. It's called ObjectStar 3.0. For the first time you can incrementally migrate from those landlocked mainframe applications, at your own pace, without the risk of detonating your business or your career. ObjectStar 3.0 provides you with a high-end solution for rapidly building and running client/server applications. A solution that integrates mainframes, servers and, of course, desktops running Windows® software. One that delivers on the scalability promise of 3-tier software partitioning, without the need for added middleware. And one that allows you to renew and blend legacy applications with all that wonderful stuff created by the folks in Redmond. The analysts agree:

“The more the development project requires integration with the mainframe environment, requires reuse of mainframe data or transactions, or requires performance in the distributed environment, the greater the competitive advantage offered by ObjectStar.” – IDC

But it isn't just the analysts who are convinced. ObjectStar 3.0 is already proving itself at Fortune 500 companies worldwide. Which is why we feel okay about spending substantially less on our advertising. For a copy of the analysts' reports or a demonstration, call us at 800-416-2888 or 214-447-5500.



Retail Technology

It's the personal touch that counts

Home centers today rely primarily on salespeople, not technology, as conduits for value-added information. By and large, that approach has worked. The Home Depot's orange-aproned sales associates played a major role in helping the company earn *Fortune* magazine's Most Admired Retailer award this year.

Count The Home Depot's CIO Ron Griffin among those who doubt whether the expense of service-oriented systems will translate into improved service levels or increased business.

"Retail is detail," he says. "You differentiate yourself through quality of execution."

The Home Depot has historically eschewed glitzy customer service applications, such as kiosks, in favor of what Griffin calls invisible applications. These include inventory management and labor scheduling systems.

IS operations are humming behind the scenes in The Home Depot's 364 stores in 30 states. The big stores, or boxes, as smaller store operators refer to them, typically cover about 100,000 sq. ft. and stock nearly 50,000 different products. For IS, the focus is on tracking those products.

Griffin thinks home centers haven't taken inventory management to the limit. He says The Home Depot's stock turnaround rates are very high compared with those of competitors in the industry. But he says there is room for improvement in areas such as receiving and perpetuals accuracy.

"Competitive advantage is ultimately decided by customers," Griffin says. And what customers value most right now is "retailers who respect their time and save them money," he says.

Tom Friedman, publisher of *Retail Systems Alert* and an influential voice in the industry, goes even further. "There's no competitive edge whatsoever in flashy, consumer-oriented technology," he says.

Perhaps so. When Builders Square recently installed PC-based kiosks near its store exits, managers at the San Antonio-based home center chain thought they had developed a novel way to gather customer feedback. Too bad the systems gathered mostly dust.

The reaction of many shoppers is summed up by Albert Clark, president of the American Homeowners Association in Washington: "Who wants to type comments into a computer when you've got a shopping cart full of supplies and a project waiting for you at home?"

The Builders Square project failed. And it's typical of early service-oriented technology efforts in the home center retail industry. ■

Early customer-focused technology efforts have had disappointing results

While there's a desire among many retailers to use more customer-focused technology, early efforts have shown that more doesn't always mean better.

One aspect of service that frustrates many home center shoppers is special orders. Despite ample inventories, these stores sell a lot of products this way, especially big-ticket items such as kitchen cabinets, doors and windows. Typically, consumers write up an order by hand, gathering parts numbers and prices from a catalog. A salesperson then reviews the order, and the store sends it to the manufacturer.

"There's all kinds of room for error because so many people get involved in the process," says Rod Albertus, a store manager at the Ernst Home Centers chain in Seattle.

Indeed, nearly 70% of special orders have mistakes, according to A. C. Thompson, president of Intermedia Systems, Inc., a Lexington, Ky., developer of interactive selling systems.

Part of the problem is the increasing number of products and the complexity of special orders, says Scott Larson, senior editor at *National Home Center News*, a New York-based trade journal. Couple that with high employee turnover rates typical of the retail industry, and you've got a training nightmare.

To whittle that number down and attract new business, Ernst rolled out Direct Source, a kiosk-based ordering system, last February in its 95 stores throughout the Northwest. According to Tom English, Ernst's vice president of IS and CIO, the touch-screen kiosks offer 45,000 items, from doors to dog kennels.

The kiosks cost \$10,000 each and have an Intel Corp. Pentium-based PC, a CD-ROM drive, a 3G-byte hard disk and custom software from Intermedia Systems. Connected via a frame-relay network to the corporate wide-area network in Seattle, the kiosks are updated regularly with price and stock information.

English wouldn't say how many orders the retailer has received so far from Direct Source. "It isn't quite up to our expectations, but we still consider it a successful rollout," he says. ■

An IS service opportunity awaits

Giant home centers may soon be forced to supplement their people-dependent service strategy with information systems. Inventory management is the bedrock of good service, and customers expect chains to have the products they want at low prices. Fail to deliver, and you can't play the game.

But IS chiefs such as Pete Ollie see an opportunity for technology at home centers to move beyond inventory systems. "Now that we've got our transaction systems solid, we can start going after customer service," says Ollie, CIO at Hechinger Stores, a Landover, Md.-based chain that operates 66 stores as well as 50 Home Quarters Warehouse stores in 21 states.

Ollie says his company is developing several customer-oriented applications. He won't elaborate on them for competitive reasons, but says all are aimed at "making the customer's experience more enjoyable."

Richard Nawrot, senior vice president of IS at Payless Cashways in Kansas City, Mo., says his chain's information-intensive service efforts might also benefit from technology.

"A large part of our business is moving information about goods and services prior to the sale, but we haven't really explored how we can use [information technology] to deliver new levels of service to the customer," Nawrot says.

Now that nearly every chain has mastered tasks such as automatic stock replenishment, the home center industry has effectively raised the bar on itself, Nawrot says. "The new challenge will be to know not just what we sold, but who we sold it to and to influence consumer behavior," he says.

Payless and other home centers are evaluating data warehouses and other customer information systems to improve promotion efforts and service. Mike Bergman, director of MIS at Grossman's, Inc. in Braintree, Mass., says such technology can enable even behemoth centers to replicate the familiar relationships local hardware store owners have with customers.

Steve Bicocchi, a principal at CSC Consulting's national retail practice in Cleveland, applauds that approach. "Customers are becoming increasingly finicky and want things done their way," Bicocchi says. "I think the home center segment must build its capability to meet individual needs in a mass way."

IS will play a crucial role in delivering such mass customization, Bicocchi says. The big chains spend more than \$100 million on IS each year. "I tell them to allocate a couple million to explore what kind of architecture they'd need to deliver individualized service. This stuff goes fast when it happens," he says. ■

McWilliams is a freelance writer in Durham, N.H.



HOW
THOUSANDS OF
INTERNATIONAL
EXPERTS
RATE AT&T NETWORK
RELIABILITY.

The best. Numero Uno. Le meilleur.

*That's what communications experts worldwide
think about AT&T reliability.*

*In fact, readers of "Data Communications"
magazine named AT&T best overall in reliability
in their U.S. and international Users' Choice Awards.
A study by an independent research firm, CIT,
went an important step further.*

*After surveying telecommunications
managers at the world's top 1000 companies, they
too named AT&T the world's most reliable carrier.*

*The number one endorsement from
independent experts. Telecommunications you
can count on. And the technology to take your
business into tomorrow today. Only from AT&T.*

*For more information about AT&T's
international services, just call 800 655-1441,
Ext. 982. From outside North America, dial the
same number preceded by the USA Direct[®] Service
access code. Go with the worldwide winner,
and your business just can't lose.*

AT&T. For the life of your business.SM



OFFICIAL
SPONSOR
1996
U.S. OLYMPIC
TEAM

©1995 AT&T

Your business depends on expanding networks of

Introducing the Candle Command Center.

New Solutions for New Problems

As your business applications and systems become more and more complex, threats to the basic health of your business multiply. In a competitive world, the costs of outages are measured by business success—or failure.

Candle Command Center™ solutions are a revolutionary approach to assuring the health of your applications in complex computing environments. In today's environment, you need more than a random collection of repackaged tools. Candle Command Center solutions reflect a commitment to true integration at all levels. They are designed with integrated system alerts, console

management and automation to protect the availability of your business applications, whatever the application or platform.

True Enterprise Systems Management

Every major platform and system can be managed with a Candle Command Center.

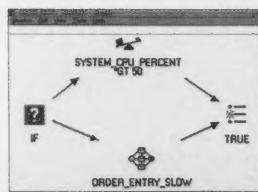
Platforms/Systems	Subsystems/Tools/DBs
■ AIX	■ CICS/MVS
■ SunOS	■ NetView
■ HP-UX	■ OpenView
■ Windows NT	■ Oracle/Sybase
■ MVS Sysplex	■ DB2/IMS
■ NetWare	■ MQSeries

Application Architecture

Using the lessons of client/server, the Candle Command Center architecture distributes systems management functionality across three components: Candle Management Server,™ Candle Management Workstation™ and OMEGAMON® Monitoring Agents.

Advanced Technology

The Candle Command Center solutions are built on Candle Technologies™ (CT™) a unique object-oriented framework. Among the features of this advanced technology, CT enables



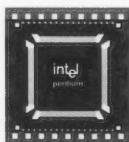
THE NEXT
REVOLUTION
IN COMPUTING
IS HERE.



AND HERE

120MHz PENTIUM® PROCESSOR.

Fly through even the most complex applications with ease. At only 2.9v, this processor gives you the power you need without sacrificing precious battery life. It's also coupled with 16MB of high-speed synchronous DRAM memory* to maximize the performance of the Pentium® processor.



AND HERE

HUGE 11.3" DIAGONAL COLOR DISPLAY.

The awe-inspiring size and 800 x 600 resolution of this display set a new standard in screen quality. PCI local-bus video delivers spectacular full-motion video and phenomenal graphics acceleration.

AND HERE

PCI LOCAL BUS ARCHITECTURE.

Unlock the true potential of the Pentium® Processor. PCI's 32-bit architecture offers the fastest levels of video performance and data throughput. Plus, it allows you to take full advantage of all Windows® 95 Plug and Play capabilities.

AND HERE

LITHIUM ION BATTERY.

Get the ultimate in long life with up to 5 hours per charge. No other battery technology comes close.

AND HERE

MODULAR QUAD-SPEED CD-ROM DRIVE.

Conduct interactive multimedia presentations, access huge databases and more. The new SelectBay architecture makes swapping this ultra-fast, optional, QuadSpeed CD-ROM drive with the modular floppy drive as easy as changing a disk!

TECRA™ IS HERE.

Introducing a portable computer so advanced, we gave it an entirely new name: Tecra™. From the modular design to the uncompromising power of the Pentium® processor and PCI, Tecra embodies Toshiba engineering at its best. Ready for the next revolution? Call 1-800-457-7777 for more information or a dealer near you.



AND HERE

WINDOWS' 95.

A host of new features comes to PC users — 32-bit speed, Plug and Play, true preemptive multitasking, an easier user interface, hot docking and more. Tecra 700 has been designed from the start to take full advantage of every one of them.

AND HERE

INFRARED PORT.

Send and receive data without wires. Beam documents conveniently through the air to infrared-equipped printers, and transfer files to any other IrDA-compliant PC.

AND HERE

STEREO SOUND.

Pump up your presentations. The Tecra 700 is Sound Blaster® Pro compatible and plays .WAV and MIDI sound files. A built-in microphone, stereo speakers and integrated headphone/speaker and microphone jacks complete your mobile audio system.

AND HERE

TWO TYPE II OR ONE TYPE III PC CARD (PCMCIA) SLOTS.

Add fax/modems, hard drives and more in a snap. This machine-of-the-moment can be customized every few seconds.

AND HERE

1.2 BILLION BYTE (=1.13GB) REMOVABLE HARD DISK DRIVE.

Here's some massive storage capacity. Even with all your applications loaded, you'll still have lots of room for graphics, video and large database files. Plus, it's easily removable for safe-keeping or upgrading later.

In Touch with Tomorrow
TOSHIBA



AND HERE



FULL-LENGTH PCI/ISA SLOTS.

Super-fast PCI card capabilities are now possible with a docking system. And you also get to keep and use your existing ISA cards in the same unit.

WINDOWS® 95 OPTIMIZED. The DeskStation was designed from the bottom up to take advantage of all Windows® 95 Plug and Play features, like hot docking.

AMPLIFIED STEREO SPEAKERS.

They're built-in and perfect for multimedia applications.



SELECTBAY™ FOR DRIVE MODULES.

Conveniently interchange the optional Quad-Speed CDROM drive with the floppy disk drive from your Tecra 700.

BUILT-IN SCSI-II PORT. Your existing and future peripherals easily link to your portable's desktop homebase through the built-in SCSI-II connector.

TWO TYPE III PC CARD (PCMCIA) SLOTS.

This machine is all about connections — and making them easy. Effortlessly connect to networks, fax/modems, additional storage and more.

5 1/4" DRIVE BAY. Allows you to install any half-height peripheral like desktop tape backup, SCSI hard disk drive, optical storage, you name it.



OPTIONAL DESK STATION V. Who needs a desktop computer? This is the ultimate in desktop displacement. With a host of connections for an external monitor, keyboard, drives, PC Cards, multimedia and more, you'll always come home to just the right gear — with more expandability and high-performance options than ordinary desktops.

Call 1-800-457-7777 for more information or a dealer near you.



TECRA™

700CT AND 700CS:

- 11.3" dia. color display in your choice of active matrix (CT) or DSTN dual scan (CS)
- 120MHz Intel Pentium® Processor (2.9v)
- 800 x 600 screen resolution
- 24-bit true color support at 640 x 480 externally
- High-speed synchronous DRAM memory (16MB expandable to 48MB on 700CT, 8MB expandable to 40MB on 700CS)

- PCI local-bus architecture
- 1.2 Billion Byte (=1.13GB) removable HDD
- SelectBay for modular 3.5" floppy disk drive or optional modular quad-speed CD-ROM drive
- Lithium Ion battery (up to 5 hour battery life)
- 16-bit Sound Blaster® Pro compatible sound system with WAV and MIDI sound support
- Built-in stereo speakers
- Audio jacks: headphone/speaker, microphone
- Two PC Card (PCMCIA) slots (two Type II or one Type III)
- Infrared data port (IrDA-compliant)

- Under 7 lbs.
- Pre-installed software: Windows® 95 or MS-DOS® with Windows® for Workgroups, Run Time Video for Windows®, Fn-esse® software and Index® video
- 3-year limited warranty
- Toll-free Technical Support — 7 days a week, 24 hours a day



In Touch with Tomorrow
TOSHIBA

Toshiba. The World's Best Selling Portable Computers.

*700CT comes standard with 16MB expandable to 48MB, 700CS comes standard with 8MB expandable to 40MB. All specifications and availability are subject to change. © 1995 Toshiba America Information Systems, Inc. The Intel Inside® Pentium® Processor logo is a registered trademark of Intel Corporation. All products indicated by trademark symbols are trademarked and/or registered by their respective companies.

mainframes and servers...

Candle has the know-how to manage them.

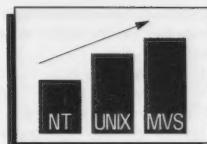
the fusion of Visual Programming with local or distributed inference engines for enterprise alert management.

Commitment to Integration

Candle has invested more than \$140 million in CT-based solutions to assure our customers of true integration. For the diverse systems managed, our CT-based solutions will have the same user interface, tables, displays and alert mechanisms.

Scalability, Reliability

At Candle we're committed to the scalability and reliability that are essential to our customers.



To meet that commitment, we are testing our solutions on one of the world's largest UNIX machines—a 512-

node SP2. Even the Candle Management Server itself can be scaled with hub versions available for MVS, AIX and Windows NT.

Take the Next Step Take Command

Learn more about the Candle Command Center today. On the Web, visit our home page at

<http://www.candle.com> See how Visual Programming and our distributed application architecture can save you time and money.

For information including papers by leading consultants describing how it all works, call a Candle representative at 1-800-843-3970.

Candle Command Center

Resource and Availability Management

Candle

MindMeld

Forget restructuring. In his new book, General Motors' IS chief says new technology-based ways of shared decision-making will make organizations really hum.

By Joseph Maglitta

Still doubt that the old hierarchical, adversarial, gut-driven way of making decisions is a one-lane highway to corporate and professional hell? Then listen to this woeful tale told by General Motor Corp. information systems veteran Vincent Barabba:

In 1978, internal politics and misread customer research killed a GM minivan prototype. (Astoundingly, Ford Motor Co. also made the same mistake). Too bad, because six years later Chrysler Corp. introduced the hot-selling Dodge Caravan. This botched decision cost GM and Ford billions in sales.

That's the most dramatic — but hardly the only — such example in Barabba's new book, *Meeting of the Minds* (Harvard Business School Publishing, \$27.95, (800) 545-7685), which arrives in bookstores today. The moral: Companies must tune all ears to the market's voice, commit to a common purpose and develop processes and software tools that promote systematic knowledge-gathering and decision-making. Those that fail to do that, he warns, face certain stagnation — or worse.

Computerworld recently spoke with Barabba, a 30-year IS and marketing executive and general manager of GM's Strategic Decision Center in Warren, Mich.

CW: What's the payoff idea for IS managers and professionals in all this?

Barabba: Your job is not just the [information technology] job. Ask, "How does what I do fit into the broader picture in the enterprise?" If you look at things that way, you could ask yourself a lot of questions about how to do your job a lot better.

CW: How does your parallel approach to making decisions differ from old, serial ways?

Barabba: The simultaneous approach says ... even though the concept implementers aren't doing anything in the beginning, they're part of the dialogue with concept generators. They can start thinking about things and give feedback, saying, "That's going to be really hard to make" or "It's not going to last as long."

[All] are interacting with the voice of the market. Out of that you get a shared vision. The obvious value is in the time saved. It's also in the richness of the dialogue.

CW: Can you give an IS example?

Barabba: In the systems group, the guys who write code say, "Give me the specs." You say, "I'm not quite sure that I got my idea right yet, but I want you to start thinking about how to do it." They say,

"I'm not going to start anything 'til you tell me what the outcome is supposed to look like."

They may have ideas in implementation that would make the idea even better. But if they won't start 'til I finish my specs, we lose a lot of capability. The ability of the downstream group to be flexible, to live with ambiguity, is key.

CW: You also exhort managers to look outside their "silo" for solutions to problems...

Barabba: You come to me and say, "I've got a systems problem." What am I going to do? I'm going to give you a systems solution. But maybe it wasn't a systems problem. Maybe it was a process problem. Maybe it was an external business problem. Maybe it was a customer problem. You've also got to make sure that your customers get out of the silo.

What if I said, "What makes you think it's a systems problem? Let's poke at that a bit." We would make sure that we agree what the problem is, that we understand it very, very well. We would look at alternative solutions — including that it's not a systems problem.

We can then say all, or any one, of these alternatives are pretty good. Then we ask if we can come up with something even better by combining the val-

ue in each of them. In our experience, you always do.

CW: Will adopting this corporate decision style benefit me if I'm a database manager, for example?

Barabba: Definitely. What's the biggest problem right now for people who want to create a data warehouse? Getting everyone who owns the data to agree on the definitions. You go to them and say, "You're going to have to change the number of digits you have in your product description." The data owners say, "You know how much that's going to cost us?"

If you get that kind of mindset, the likelihood of creating a cross-enterprise data warehouse is very low. But if we have a common process, we will go through the same process every time and use the same data set.

CW: But as a database manager, it's unlikely I'd have the clout to force this process standardization.

Barabba: If your boss was the [chief information officer], I'd go find him and say, "We really ought to go to work on this kind of stuff." Maybe even the CIO can't do it. But you ask, "If we went at it together, who in the company would work on a team to cause this to happen?" Maybe you've got to get a counterpart in some other function and say, "Let's go talk to the boss."

CW: Does this kind of shared decision-making require any kinds of new systems or technology?

Barabba: There's more technological capability out there than we're using. A lot of the new stuff is going to be in groupware. As we create objects, the infrastructure will get fatter and the applications thinner.

CW: Does this relate to re-engineering?

Barabba: Re-engineering often results in restructuring. Everybody is going to worry about who they're going to report to next. It can get really ... demoralizing.

Changing the decision-making process is a form of re-engineering. When you get the enterprise process model in place, it really doesn't matter who you report to. If you want to change the culture, go right to the decision process.

Maglitta is Computerworld's senior editor, corporate strategies.



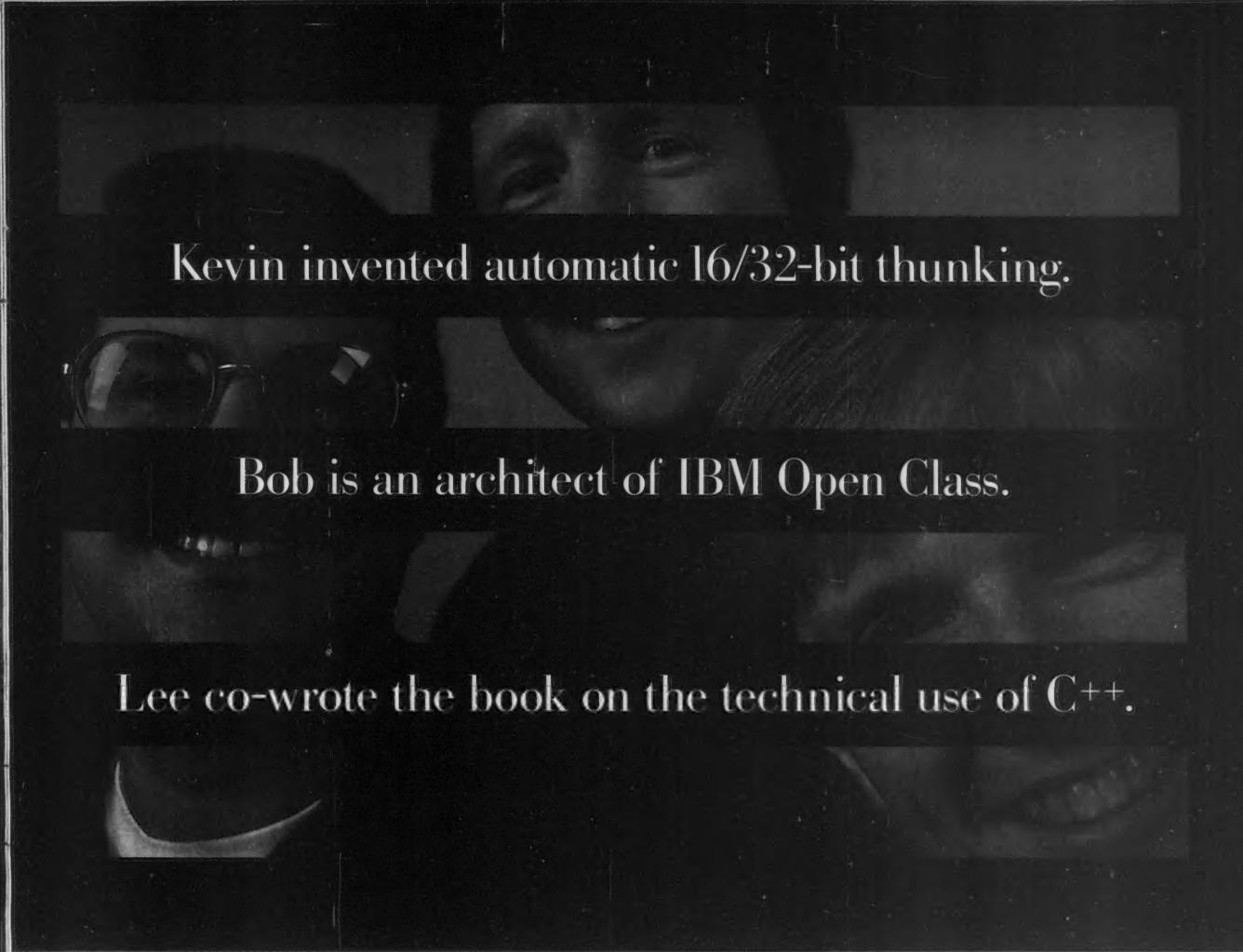
Vincent Barabba

Meeting of the Minds

Creating the Future of Business



Vincent P. Barabba



Kevin invented automatic 16/32-bit thunking.

Bob is an architect of IBM Open Class.

Lee co-wrote the book on the technical use of C++.

And they're all dropping by for a conversation.

<http://www.software.ibm.com>

No hype. No rules. Just person-to-person dialogue with the IBM researchers who have helped make C++ what it is today—and who are working on even hotter products for tomorrow. They'll be appearing at our web site in monthly forums devoted to the edgiest topics in the object-oriented world. So bring your ideas and, of course, those burning questions. Our people are eager to talk.

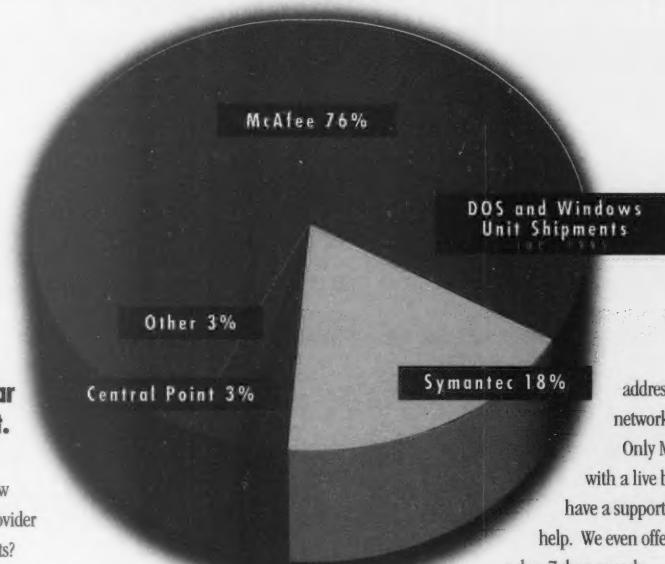
IBM is a registered trademark and Solutions for a small planet is a trademark of International Business Machines Corporation. The IBM home page is located at <http://www.ibm.com>. Pictured, from left to right: Lee, Bob and Kevin. John, Rod, Christina and John Barton (Lee's co-writer) were being consumed by code and had to pass on the photo opportunity. © 1995 IBM Corporation. All rights reserved.

<u>October</u>	Design Patterns Visual Programming	John Vlissides Rod Smith
<u>November</u>	Writing Efficient C++ Code Class Library Design	Kevin Stoodley Bob Love
<u>December</u>	Incremental C++ SOM Programming	Lee Nackman Christina Lau



Solutions for a small planet™

HOW THE WORLD'S BIGGEST ANTI-VIRUS COMPANY



McAfee has raised the bar on network management.

You may know us as the leader in anti-virus software, but did you know McAfee is also the world's largest provider of PC network management products?

In fact, eighty of the Fortune 100 companies use our products. And next year McAfee will be one of the top 25 software companies in the world. That's because we've pioneered new and innovative ways to give customers what they need.

Unlike our shrink-wrap competitors, McAfee provides fully-functioning

Download McAfee

Only McAfee lets you download any product for a free trial—with no time bombs.

versions of our products that you can download from the Internet. Free. So you can immediately evaluate any McAfee product anytime, day or night.

Unlike our shrink-wrap competitors, only McAfee's complete product line

addresses all major aspects of network management.

Only McAfee answers your call with a live body—because when you have a support problem you need instant help. We even offer technical support 24 hours a day, 7 days a week.

And only McAfee offers on-site consulting to ensure that our products provide the solutions you envisioned.

We also give you a known cost of ownership with a subscription plan that makes all upgrades, updates and technical support free for two years.

And we're adding new innovations all the time.

The broadest product line with the fullest feature sets.

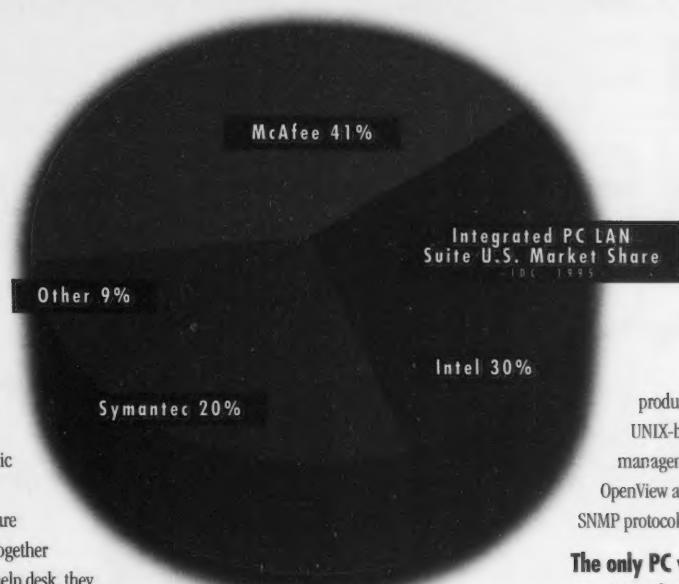
McAfee offers the greatest variety of network management solutions. You can choose from our top-rated point products and trade up to our powerful integrated suites when you're ready. Or you can select those suites today for maximum control over your entire network.

No matter what you need, McAfee can supply it. And support it. As a single vendor, we also ensure that our products work together seamlessly.



Integrated asset management, desktop management, and server backup.

BECAME THE WORLD'S BIGGEST PC NETWORK MANAGEMENT COMPANY.



Our asset management point products include *SiteMeter* software metering, *SiteExpress* electronic software distribution and *LANInventory* hardware and software

 inventory management. Together with *LAN Support Center* help desk, they comprise our *BrightWorks* integrated suite.

We also provide desktop configuration management and asset management through *Saber LAN Workstation*. And *Saber LAN Workstation* is the only suite that includes server backup and full server management. No other product offers such a broad feature set.

Full cross-product integration across the entire enterprise.

Only McAfee gives you full TCP/IP support so that our products scale from the department LAN to the enterprise WAN.

INTEGRATION

Of course, we use common data formats, reporting, alerting, agents and scripting across all our modules. All of which are accessed from a central management console.

McAfee's management products can scale individually or as part of a suite. Each one serves as a modular, interoperable building block in McAfee's total

enterprise systems management approach.

We're also the only vendor to have designed specifically for the Netware 4.1 NDS and Windows NT environments. So you can take advantage of your specific NOS rather than accept our competition's less capable, NOS-independent



World's best virus detection and removal for DOS, OS/2, Windows 3.1, 95, and NT.

Comprehensive, top-rated virus protection for NetWare and NT file servers.

products. Plus, we integrate into UNIX-based enterprise network management consoles such as HP OpenView and IBM NetView via the SNMP protocol suite.

The only PC vendor providing open systems architecture.

To give the network manager even greater flexibility, McAfee developed *LANOpen*, an industry-standard open architecture for use with all LAN management applications.

LANOpen allows you to mix and match management packages from different vendors. You can even share information between different applications. So you can use the application that best meets your needs.

And to enhance the open systems environment, we're also working with the DMTF on the DMI standard.

For more information on the network security and management software, support, and innovations that built the industry leader, call McAfee today at **1-800-332-9966**.

Find out how raising the bar the highest has made us the biggest.

	McAfee	Intel	Symantec
Enterprise Support			
Multi Server	X	X	X
Netware & Windows NT	X	NO	X
TCP/IP WAN	X	NO	NO
SNMP UNIX	X	X	NO
SQL	X	NO	NO

Only McAfee supports you across the enterprise.

	McAfee	Intel	Symantec
Products			
Asset Management	X	X	X
Anti-virus	X	X	X
Remote Control	X	NO	X
Storage Management	X	NO	X
Desktop Management	X	NO	NO
Help Desk	X	NO	NO
Performance Tuning	X	NO	NO

McAfee offers the broadest product line available.

MCAFEE
Network Security & Management

Download McAfee

WebServer: www.mcafee.com Internet: McAfee.com BBS (408)988-4004 America Online: MCAFEE CompuServe: GO MCAFEE The Microsoft Network: GO MCAFEE

REMEMBER THAT FREE LOVE THING FROM THE 60'S?

It's about openness. Freedom. And not discriminating on the basis of

operating system. It's the StorageWorks™ RAID Array 410 Subsystem.

And it connects beautifully with UNIX® systems from Sun, IBM,

HP and Digital. Once attached, it works at unbeatable speeds: up to

4,700 I/O per second. It also gives you tremendous freedom to

expand, with as many as 42 drives on a single controller. Most of all,

it gives you security: drives,

supplies offer bot-

hot spares, meaning

a distant memory.

the 410 protects

with multi-platform

standard disk drives. And with our attractive pricing, your investment

digital

will quickly pay for itself. Tested 100% for compatibility, the

RAID Array 410 is the safest storage

you'll ever have. Want to know more? Groovy. Call us at 1-800-786-7967.

SEE US AT COMDEX BOOTH L4002 NORTH HALL.

© 1991 Digital Equipment Corporation. The Digital logo, StorageWorks and the StorageWorks logo are trademarks of Digital Equipment Corporation. UNIX is a registered trademark of The Open Group. Other names and other products are used and may be trademarks through 3Com Company. All other products are trademarks or registered trademarks of their respective holders.

StorageWorks

RAID ARRAY 410
SUBSYSTEM

- **Supported RAID levels:** 0, 1, 3, 5, 6
- **Office capacity:** up to 1.2 TB (120 drives)
- **Disk capacity:** 4GB to 10GB per drive
- **Maximum I/O rate:** 4,700 I/O per sec.
- **Maximum transfer rate:** 20MB per sec.
- **Read/Writeback cache:** 32MB
- **Maximum drives per controller:** 42
- **Built-in diagnostics**



fans and power

swapping and

downtime can be

You'll also love the way

your storage investment,

support plus industry-

**IT
CAME
BACK
AS A
STORAGE
UNIT**





NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-4144



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-4144



Fill it out. Fax it in. Save \$8. Fax No. (614)382-1058

Yes, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$39.95* per year - a savings of \$8.00 off the basic subscription price.

First Name	MI	Last Name
Title		
Address		City
Address Shown: <input type="checkbox"/> Home <input type="checkbox"/> Business <input type="checkbox"/> New <input type="checkbox"/> Renew		Basic Rate: \$48 per year
* U.S. Only. Canada \$95, Mexico, Central/South America \$150, Europe \$295, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.		
Please complete the questions below to qualify for this special rate.		
<p>1. BUSINESS/INDUSTRY (Circle one)</p> <p>10. Manufacturer (other than computer) 20. Finance/Insurance/Real Estate 30. Medical/Law/Education 40. Wholesale/Retail/Trade 50. Business Service (except DP) 60. Government - State/Federal/Local 65. Communications Systems/Public Utilities/ Transportation 70. Mining/Construction/Petroleum/Refining/Agric. 80. Manufacturer of Computers, Computer- Related Systems or Peripherals 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services 90. Computer/Peripheral Dealer/Dist./Retailer 95. Other _____</p> <p>(Please Specify)</p>		
<p>2. TITLE/FUNCTION (Circle one)</p> <p>IS/MS/DP MANAGEMENT 15. Chief Information Officer/Vice President/ Asst. VP IS/MS/DP Management 21. Dir./Mgr.: MIS Services, Information Center 22. Dir./Mgr.: Network Sys., Data/Tele. Comm., LAN Mgr.,/PC Mgr., Tech Planning, Admin Svcs. 23. Dir./Mgr.: Sys. Development, Sys. Architecture 31. Programming Management, Software Developers 41. Engineering, Scientific, R&D, Tech. Mgr. 60. Sys. Integrators/VARs/Consulting Mgr.</p> <p>CORPORATE MANAGEMENT 11. President, Owner/Partner, General Mgr. 12. Vice President, Asst. VP 13. Treasurer, Controller, Financial Officer</p>		
<p>DEPARTMENTAL MANAGEMENT</p> <p>51. Sales & Mktg. Management 70. Medical, Legal, Accounting Mgt.</p> <p>OTHER PROFESSIONAL MANAGEMENT</p> <p>80. Information Centers/Libraries, Educators, Journalists, Students 90. Other Titled Personnel</p>		
<p>3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)</p> <p>Operating Systems (a) Solaris (e) Mac OS (b) Netware (f) Windows NT (c) OS/2 (g) Windows (d) Unix (h) NeXTstep</p> <p>App. Development Products <input type="checkbox"/> Yes <input type="checkbox"/> No Networking Products <input type="checkbox"/> Yes <input type="checkbox"/> No</p>		

COMPUTERWORLD

E4K5-9

Fill it out. Fax it in. Save \$8. Fax No. (614)382-1058

Yes, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$39.95* per year - a savings of \$8.00 off the basic subscription price.

First Name	MI	Last Name
Title		
Address		City
Address Shown: <input type="checkbox"/> Home <input type="checkbox"/> Business <input type="checkbox"/> New <input type="checkbox"/> Renew		Basic Rate: \$48 per year
* U.S. Only. Canada \$95, Mexico, Central/South America \$150, Europe \$295, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.		
Please complete the questions below to qualify for this special rate.		
<p>1. BUSINESS/INDUSTRY (Circle one)</p> <p>10. Manufacturer (other than computer) 20. Finance/Insurance/Real Estate 30. Medical/Law/Education 40. Wholesale/Retail/Trade 50. Business Service (except DP) 60. Government - State/Federal/Local 65. Communications Systems/Public Utilities/ Transportation 70. Mining/Construction/Petroleum/Refining/Agric. 80. Manufacturer of Computers, Computer- Related Systems or Peripherals 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services 90. Computer/Peripheral Dealer/Dist./Retailer 95. Other _____</p> <p>(Please Specify)</p>		
<p>2. TITLE/FUNCTION (Circle one)</p> <p>IS/MS/DP MANAGEMENT 19. Chief Information Officer/Vice President/ Asst. VP IS/MS/DP Management 21. Dir./Mgr.: MIS Services, Information Center 22. Dir./Mgr.: Network Sys., Data/Tele. Comm., LAN Mgr.,/PC Mgr., Tech Planning, Admin Svcs. 23. Dir./Mgr.: Sys. Development, Sys. Architecture 31. Programming Management, Software Developers 41. Engineering, Scientific, R&D, Tech. Mgr. 60. Sys. Integrators/VARs/Consulting Mgr.</p> <p>CORPORATE MANAGEMENT 11. President, Owner/Partner, General Mgr. 12. Vice President, Asst. VP 13. Treasurer, Controller, Financial Officer</p>		
<p>DEPARTMENTAL MANAGEMENT</p> <p>51. Sales & Mktg. Management 70. Medical, Legal, Accounting Mgt.</p> <p>OTHER PROFESSIONAL MANAGEMENT</p> <p>80. Information Centers/Libraries, Educators, Journalists, Students 90. Other Titled Personnel</p>		
<p>3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)</p> <p>Operating Systems (a) Solaris (e) Mac OS (b) Netware (f) Windows NT (c) OS/2 (g) Windows (d) Unix (h) NeXTstep</p> <p>App. Development Products <input type="checkbox"/> Yes <input type="checkbox"/> No Networking Products <input type="checkbox"/> Yes <input type="checkbox"/> No</p>		

COMPUTERWORLD

E4K5-9

Management

Calendar

Nov. 8- Dec. 1

MANAGEMENT

Making Your Sales Process a Strategic Competitive Advantage. Dallas, Nov. 9. — Topics include: the business case for sales force automation, methodology for business process analysis and development, and generating competitive advantage through contract management. Contact: CPI, Dallas, Texas (800) 622-4786, ext. 46349.

Joint Application Development (JAD) Facilitation and Implementation Seminar Using Object-Oriented Software Engineering. Stamford, Conn., Nov. 13-15 — Focus is on how to manage and facilitate JAD projects. The workshop provides training in facilitation techniques needed to capture the deliverables for the object-oriented application development life cycle using Rumbaugh and Jacobson methods. Fee: \$1,475. Contact: Pierson Applications Development, Inc., Stamford, Conn. (203) 322-1606.

Market-Driven Product Definition. Cleveland, Nov. 14 — Topics include: what customers want, how marketers and engineers can agree on customers needs, the prerequisites to successful product definition and creating the right product at the right time. Also offered Dec. 14 in San Diego. Contact: Registrar, Management Roundtable, Inc., Waltham, Mass. (800) 338-2223.

IT Services '95 Conference & Showcase. Washington, Nov. 15-17 — Theme: "Professional Services in Multivendor Environments." Topics include: covering services issues, outsourcing systems and network integration, consulting and re-engineering. Fees: two-day conference, \$795 (government, \$595); one day, \$495 (government, \$395). Contact: Creative Expos and Conferences, Inc., Walpole, Mass. (508) 660-7099.

Electronic E-Cash. San Francisco, Nov. 16-17 — Theme: "Commercial Opportunities, Technological Innovations, Security Implications." Topics include: forces that shape the electronic commerce market, real-world and government policy implications, evaluating the demand uses and service opportunities available. Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400.

Business/Disaster Recovery. Atlanta, Nov. 29-30 — Topics include: preparing for business recovery, the plan itself, dealing with the unexpected, recovering PC LANs, dealing with employee stress and assuring a successful aftermath. Contact: Lynn Ganim, LOMA, Atlanta, Ga. (770) 984-6459.

Interactive Learning Technologies Conference. Washington, Nov. 29-30 — Focus is on helping to maximize the training dollars of corporate training and development professionals who use interactive technology. Contact: Spectrum Human Resource Systems Corp., Denver, Colo. (303) 534-8813.

Tools & Technology for Self-Directed Learning. Scottsdale, Ariz., Nov. 27-30 — Theme: "Innovative, Interactive Training Systems for Boosting Employee Performance." Topics include: self-directed learning and teams, self-managed learning and multimedia/computer-based learning. Contact: International Quality & Productivity Center, Little Falls, N.J. (201) 256-0211.

INDUSTRIES

Data Warehousing Strategies for Insurance Companies. New York, Nov. 8-10 — Topics include: developing a flexible central repository, structuring the data so it is easily available to decision-makers, keeping data accurate through regular "cleaning" and maintenance of the warehouse. Contact: Global Business Research Ltd., New York, N.Y. (212) 645-4226, ext. 3006.

Council for Electronic Revenue Communication Advancement — Fall Membership Conference. Arlington, Va., Nov. 9-10 — This conference will update electronic revenue communications stakeholders on the latest advancements in the field. Included are updates by the IRS and other government department officials and industry leaders. Contact: Lisa Karmen, Council for Electronic Revenue Communication Advancement, Chicago, Ill. (312) 644-6610.

Comtrade: The Global Event for Computers and Communications in Health Care. Atlanta, Nov. 15-18 — Topics include: computers and communications in health care, computer hardware and software systems, communications networking, electronic bar coding and data interchange. Contact: PAN Communications, Andover, Mass. (508) 474-0055.

Cause '95. New Orleans, Nov. 28-Dec. 1 — For information systems professionals in education. Topics include: extending legacy applications to the new enterprise architecture, client/server architecture for mainstream administrative systems and sustaining and supporting mainstream use of instructional technology. Fees: Cause members, \$430; nonmembers, \$630. Contact: Cause Professional Development, Boulder, Colo. (303) 939-0315.

USER GROUPS

TeleForum. San Diego, Nov. 30-Dec. 1 — Focus is on giving resellers information and training to develop mission-critical applications using Teleform, Cardiff Software, Inc.'s forms processing software. Contact: Cardiff Software, Carlsbad, Calif. (619) 931-4500.

TECHNOLOGIES

The Third Color Imaging Conference. Scottsdale, Ariz., Nov. 7-10 — Focus will be on creation, transmission, reproduction and display of color images, both traditional and digital. Jointly sponsored by the Society for Information Display and the Society for Image Science & Technology. Contact: Pam Forness, Society for Image Science & Technology, Springfield, Va. (703) 642-9090.

Autofact '95. Chicago, Nov. 12-16 — One of the top annual expositions on manufacturing systems, Autofact targets design engineers, process engineers, systems integrators and managers. Contact: Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

Advanced Marketing Strategies for the Internet & Other On-line Services. Boston, Nov. 13-15 — Topics include: creating a World Wide Web site

that ensures usage and exposure, developing the appropriate infrastructure, brand management in the Electronic Age, promotion and event marketing and performance measurement. Fee: \$1,295. Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400.

Comdex/Fall '95. Las Vegas, Nov. 13-17 — Topics include: management strategies, business on the Internet, multimedia, distributed computing, the changing desktop, wireless and mobile computing, technology fundamentals, business process re-engineering and outsourcing. Contact: Softbanks Comdex, Inc., Needham, Mass. (617) 449-6600.

Power Testers. Orlando, Fla., Nov. 13-17 — Focus is on ways people are solving tough testing problems and concentrating on practice. Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Re-engineering Cellular: For the New Competitive Reality. Washington, Nov. 14-15 — Topics include: capturing the mass consumer market, beating your competitors, personal communications services and the other cellular incumbent, technical solutions for reducing capital costs, next-generation billing and customer care systems. Fee: \$985. Contact: TeleStrategies, Inc., McLean, Va. (703) 734-7050.

Field & Sales Force Automation. Boston, Nov. 28-30 — Keynotes: "Virtual Selling" by Tom Siebel, president and chief executive officer of Siebel Systems, Inc.; "Delivering the Promise of Personal Communications Services" by Jai Bhagat, president and CEO of Skytel; and "The Wireless Transformation" by Ken Arneson, vice presi-

dent of business development at AT&T Wireless. Fees: Sales Automation Association member, \$599; nonmembers, \$729. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Call Center Tech '95. Las Vegas, Nov. 29-Dec. 1 — Theme: "Gaining a Competitive Edge Through the Deployment of Customer-focused Technology." Topics include: computer telephone integration, voice and data desktop products, interactive voice response, automatic number identification and knowledge-based systems. Fee: \$1,195. Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400.

Faxworld '95. San Francisco, Nov. 29-Dec. 1 — Focus is on helping information systems and communications professionals who are using or implementing fax-integrated messaging technologies in their organizations. Keynotes by Chris Roeckl, executive editor of *Communications Week*, on "A Vision of an Integrated Communications Strategy" and Mark Skapinker, president of Delrina Corp., on "The Future of Fax Software." Fee: \$995. Contact: Customer Service at BIS Strategic Decisions, Norwell, Mass. (800) 874-9980.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

SEND ANNOUNCEMENTS TO

Allan Alter, Senior Editor/
Management, Computerworld,
500 Old Connecticut Path, Framingham,
Mass. 01701. Fax: (508) 875-8931.

MEDICAL ALERT... Avoid Nervous Stress Disorder when Moving to Unix



Stop worrying about your programming productivity in Unix! Use the mainframe-style tools you've been using for years.

uni-XEDIT cms-style Editor with Full Macro Support

uni-REXX Portable System Control and Macro Language

uni-SPF ispf-style Editor, Browse, Utilities, even Dialog Mgmt!

wrk/grp
The Workstation Group

800-228-0255
sales@wrkgrp.com
http://www.wrkgrp.com

OCTOBER 30, 1995 COMPUTERWORLD

THE CONTINUING ADVENTURES OF
COMMANDER UNIFACE



THE
 MOST ROBUST
 AND ADAPTABLE
 CLIENT/SERVER
 APPLICATION-BUILDING
 STRONGWARE IN ALL GALAXY-DOM

BY COMPUWARE

In a far corner of the cosmos where true enlightenment only rarely shines, a desperate plea for help goes out for our handsome hero, whose motto strikes fear in the minds of weenies throughout the universe: "Have strongware, will travel."



...our mighty warrior is greeted by a babble of voices crying for help to free them from legacy technologies.

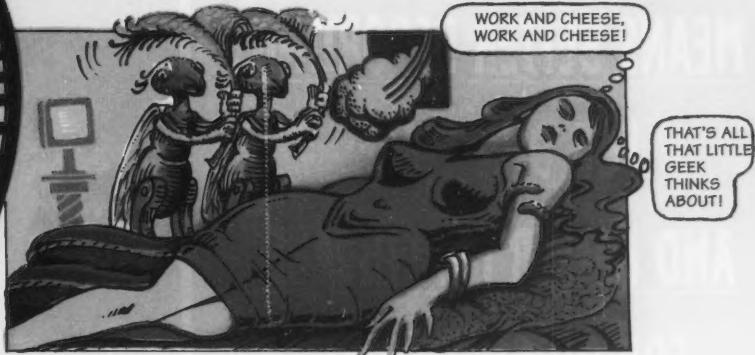


"Listen up!" he booms in a deep, tugboat rumble. "What you need is the Technology Independent Deployment of my mighty application-building strongware, UNIFACE, rather than some wimpy, inflexible product that may have been sold to you by that intergalactic scalawag, Mordecai Snerdly!"



SYBASE, ORACLE, UNIX, OS/2, WINDOWS, WINDOWS 95 and DOS are trademarks or registered trademarks of their respective companies. Compuware and UNIFACE are registered trademarks of Compuware Corporation. ©1995 Compuware Corporation

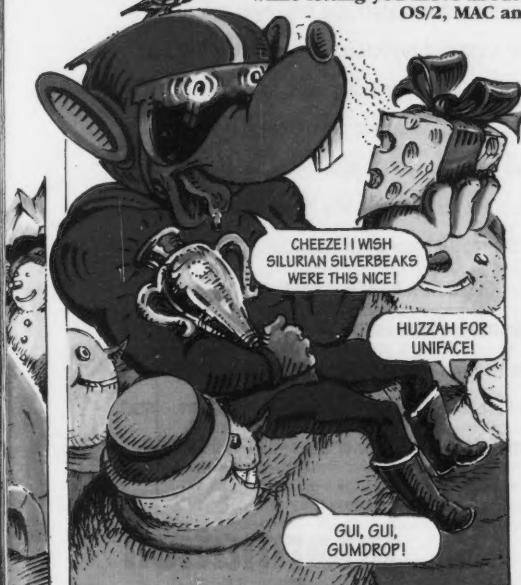
Answering the call, Commander Uniface exits the perfumed chambers of Maive, Queen of Zorgongola...



Touching down on the frozen landing pad at Tundraville...



"Moreover," he continues, never knowing when to shut up, "UNIFACE lets you exploit new stuff like stored procedures, multitasking and Windows 95, while letting you move about between OS/2, MAC and Motif."



Hey, cool people!
If you want a UNIFACE White Paper (and one of my hot, new T-shirts), call

800 365 · 3608

catch us on our Web Home Page at

<http://www.compuware.com>

or better yet, fax your business card to

810 737 · 7119

and find out more about UNIFACE strongware from Compuware. In a cold, cold world, it's enough to warm your day.

UNIFACE



WHAT THE BIG GUYS USE



COMPUWARE
Uncomplicating Your Life

"EDA/SQL MIDDLEWARE MEANS BETTER REPORTING FOR OUR STAFF AND BETTER HEALTHCARE FOR OUR PATIENTS."



*James Wells, VP and CIO
Magee-Womens Hospital
Pittsburgh, PA*

With Informix databases for radiology systems, Gupta databases for labor and delivery systems, C++ databases for laboratory systems, VSAM databases for financial applications, and Shared Medical Systems proprietary databases for hospital information, Magee-Womens Hospital in Pittsburgh boasts one of the most complex information environments anywhere. How does the hospital combine and report from data located in so many heterogeneous file structures and operating systems without hiring a boatload of expensive programmers and application specialists? The answer...EDA/SQL middleware from Information Builders.

INVESTING IN THE RESOURCES THAT COUNT!

With EDA/SQL middleware, the hospital's doctors, nurses,



technicians, accountants, administrators, and marketers can all use today's most popular front-end applications and reporting tools for transparent access to the information they need, no matter how it's structured or where it resides. So instead of investing in more programming resources, it can invest in superior patient-care and research to better serve the community. Perhaps this is why Magee-Womens Hospital was cited as one of the top 10 hospitals in the nation.

SEND FOR A FREE VIDEO!

EDA/SQL...the process is transparent, the benefits are obvious. For more information and a free video on how Magee-Womens Hospital and other companies have realized outstanding benefits from EDA/SQL middleware, contact your local Information Builders sales office or call **1-800-969-INFO**.
In Canada Call 416-364-2760



EDA/SQL is the trademark of Information Builders, Inc., 1250 Broadway, NY, NY 10001.

EDA/SQL®
Transparent Enterprise Data Access

**Information
Builders**

In Depth

SO WHAT'S ALL THIS ABOUT... WORKFLOW?

BOMBARDED WITH QUESTIONS BY MANAGEMENT, BAMBOOZLED BY SUPPLIERS, YOU NEED TO COME TO THE TABLE KNOWING WHAT WORKFLOW CAN DO FOR YOU TODAY — AND WHERE IT'S GOING

WORKFLOW DEFINED

Workflow software automates and tracks the flow of documents and work processes through a company. The focus is on how work normally moves through an organization — the process — instead of on the specific information. There is a consensus today that you can break workflow products down into four groupings:

Production workflow:

Deals with transaction-oriented, high-value, repetitive processes such as insurance claims or accounts payable. Representative vendors include IBM, FileNet Corp., Wang Laboratories, Inc., BancTec, Inc. (formerly Recognition International), ViewStar Corp., Unisys Corp., AT&T Global Information Solutions, Staffware Corp., Xsoft and IA Corp. Average 1994 price: \$1,050/seat*.

Collaborative workflow:

Deals with high-value, nonrepetitive, generally nontransaction-oriented processes such as new product development, sales force automation or technical document assembly. Representative vendors include Xsoft, Action Technologies, Inc., Digital Equipment Corp., FileNet, Documentum, Inc., Keyfile Corp., Intergraph Corp. and Novasoft Systems, Inc. Average 1994 price: \$500/seat*.

Administrative workflow:

Deals with low-value processes generally connected to routine office work such as travel expense reporting, budgeting and purchase approvals. Essentially electronic-mail forms. Representative vendors include Reach Software Corp., Delrina Corp., WordPerfect, Microsoft Corp., Jetform Corp. and Banyan Systems, Inc. Average 1994 price: \$113/seat*.

Ad hoc workflow:

Deals with low-value processes generally connected to routine office work such as FYI routing, review and approval. Lots of ad hoc products are E-mail-based and workflow software is beginning to be offered as a feature function in messaging products. Representative vendors include Lotus Development Corp., Keyfile, Microsoft and WordPerfect. Average 1994 price: \$180/seat*.

*Pricing for stand-alone workflow software products comes from BIS Strategic Decisions



By AMY MALLOY, LAURA HUNT AND LORY DIX

What questions must potential buyers ask workflow vendors?

- What are your plans for cross-platform support?

• How can your workflow product be integrated with groupware?

— Connie Moore, director of workflow, document and imaging strategies, BIS Strategic Decisions, Norwell, Mass.

- Do you support multiple servers?

• Do you have a process mapping interface that graphically illustrates the workflow process?

• Do you use an open database repository to store all rules, routing instructions and workflow definitions? By "open database" I mean industry-accepted technologies such as databases from Oracle Corp., Sybase, Inc. or Informix Software, Inc.

• Do you have the ability to capture and report on runtime statistics such as when every task begins, how much time elapses between tasks, what the workload is for every individual in the work process and what the throughput and transaction volume is? I want to use the information about how the workflow is being executed to modify and enhance operations and processes.

— Thomas M. Koulopoulos, president, Delphi Consulting Group, Inc., Boston

- How do I get my people to use workflow?

• How can I keep my processes growing and up to date without a lot of redevelopment?

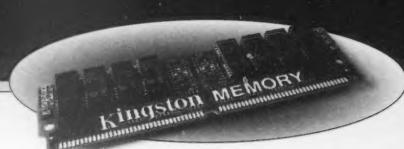
— Ronni Marshak, senior analyst, Patricia Seybold Group, Boston

Workflow, page 97

MAYBE YOU DON'T
NEED MORE PEOPLE.

MAYBE YOU DON'T
NEED MORE TIME.

MAYBE YOU JUST
NEED MORE MEMORY.

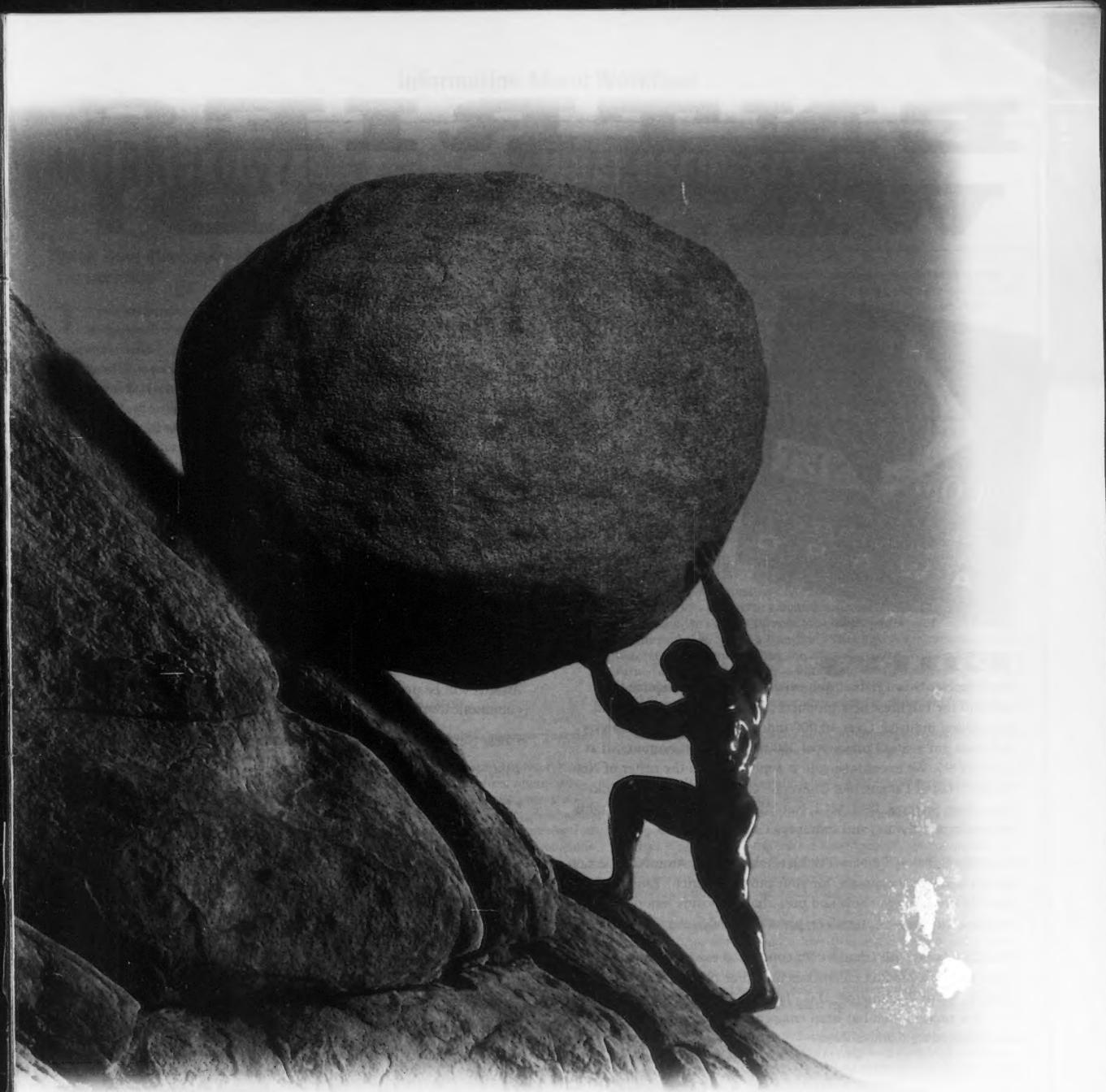


For more information call us at

(800) 435-0057

or look for us on the Net:

<http://www.kingston.com>



These days, you can sum up the human condition like this: too much work, not enough time. Computers, of course, are supposed to ease the burden. But now, with all the new memory-hungry software out there, many computer systems aren't up to the task. Fortunately, there's a simple solution: add more memory. Recently, an independent study* revealed that by adding just four megabytes of memory, the average manager became 26% more productive. The average number cruncher improved by 12%.

So, why Kingston memory? Because Kingston makes memory for almost every PC, server, printer, and workstation known to man. Our memory is designed to meet, or even exceed, the specifications set by leading computer manufacturers. We test every cell on every chip on every module. (On a 16 megabyte module, that's 128 million cells.) If you ever need help, our service and support will quickly shoulder the load. Is it any wonder Fortune 1000 companies use Kingston memory more than any other brand?

Kingston
TECHNOLOGY CORPORATION

ENTRIES WANTED!



LAST SEEN
by thousands at ComNet '95. Known for
spotlighting the best new products
in the communications/networking industry.

REWARD:
Maximum exposure before, during and after
ComNet for your new product launch.

Entry

The ComNet New Product Achievement Awards recognize the best and the brightest new products in the communications and networking industry. Over 40,000 industry professionals, analysts and press got a sneak preview of 350 new products announced at ComNet '95. We encourage you to apply and join the roster of New Product Hall of Famers like Cheyenne Communications, Cylink Corp. Fore Systems, IBM, MCI, Net Edge Systems, Northern Lights Cable, Orion Atlantic, and Promptus Communications.

Enter the ComNet '96 New Product Achievement Award Competition and get maximum exposure for your product launch! You'll receive valuable pre-show, at-show and post-show exposure among our exclusive audience of attendees, press and analysts!

Who Can Apply? All ComNet '96 contracted exhibitors debuting a new product, product enhancement and/or product upgrade at ComNet '96 in Washington, D.C., January 29 - February 1, 1996. Or a new product that has been announced within six weeks preceding ComNet '96.

Awards

Awards will be presented in 9 categories representing the communications and networking market:

- Best New Transport Technology Product
- Best New Network Management Product
- Best New Carrier Service
- Best New LAN and Internetworking Product
- Best New Switching Technology Product
- Best New Infrastructure Product
- Best New Multimedia and Desktop Product
- Best New Wireless Product
- Best New Software and Applications Product
- And a Grand Prize to the Most Innovative New Product or Service

The ComNet '96 New Product Achievement Award is proudly sponsored by:

COMPUTERWORLD
the Newspaper of Information Systems Management

For More information on exhibiting, attending or speaking at ComNet '96, contact MHA Event Management at 617-440-2830. For New Product Achievement Award information and entry form, contact Cress O'Brien at 617-440-2830. ComNet '96 is managed by MHA Event Management, 1400 Providence Highway, Norwood, MA 02062

Warning:
Only the best, newest, most innovative,
groundbreaking products may apply.
Call 617-440-2830 today for complete
information and an entry form.
Deadline for entries: December 15, 1995.

Information About Workflow

SO WHAT'S ALL THIS ABOUT . . .

WORKFLOW?

CONTINUED FROM PAGE 93

What does the future hold for workflow?

There is an emerging market for workflow as middleware embedded in all kinds of computer systems.

In the future, users will buy workflow as part of a bigger suite of software, and they will look at the overall software package rather than workflow by itself. It's happening right now; application software companies such as SAP America, Inc. and PeopleSoft, Inc. are putting workflow [tools] into their product offerings. Some of the document management products are workflow-enabled now.

Workflow is getting caught up with business process re-engineering, and one of the things that will be happening is business process re-engineering tools will be more closely integrated with workflow.

— Connie Moore

It's absolutely clear that workflow will be embedded as part of an overall business operating system within five years. It's beginning to happen. Microsoft is working with Keyfile to incorporate the Keyfile engine with its Exchange product. Microsoft is also working with Wang, Novell, Inc. is working with FileNet on an upcoming product suite called Ensemble, which incorporates some very basic FileNet workflow technology.

Also, as desktops become more and more object-oriented, some of these objects will take on a knowledge-based component — we call it workflow. The general functionality of taking rules and bundling them with an information object, I think, is absolutely a trend. We'll see it on the desktop in about five years.

On the information systems skills side, workflow will demand people who have a greater understanding and appreciation for object orientation and object-oriented standards such as CORBA [the Object Management Group's Common Object Request Broker Architecture] and OpenDoc. A lot of the more advanced workflow tools are heavily object-oriented.

IS will also need to know business analysis. IS people will have to go in and work with the end-user organizations directly. These analysts won't just gather requirements, but they will help the end-user organization better understand the process and start making some serious changes to the process if needed.

— Thomas M. Koulopoulos

WHAT USERS SAY

ROSS BOULET

Vice president of management
Management Consulting Corp.
Texas Commerce Bank
Houston

Uses workflow for consumer loan back-office processing. Loan gets faxed into the image system directly and ViewStar software automates the processing of the application through to the creation of a customer loan contract.



WHAT IMPROVEMENTS WOULD YOU LIKE TO SEE IN WORKFLOW SOFTWARE?

WALLIS: I would like the "superuser" to be able to control work a little more dynamically from the client end. My impression right now of workflow is that it is still mainly in the control of the systems area — programmers and application developers. There are some tools that make it easier for the superuser to move work around from place to place, but I don't think it has evolved to quite the wonderful graphical user interface everybody thinks it is. I would just like to see things become more open.

MANCI: Workflow software vendors need to open up to front-end customization via tools such as Microsoft's Visual Basic, Powersoft's PowerBuilder and Borland International's Delphi.

KESNER: I think products lack user front ends, and we have to develop those ourselves at great expense. I would like graphic representations of workflow status — things that are user-friendly and graphically oriented so our customers can use the tool without our intervention.

WHAT TIPS DO YOU HAVE FOR YOUR COLLEAGUES?

MANCI: If a vendor promises it can handle your production volume, make sure you see its product in a similar environment handling that level of production. We said, "We'll need to do 40,000 pages a day," and sales people said, "We do that all the time." They give you references, and the biggest one ends up handling only 500 pages a day. With several firms, it turned out that their product could not physically handle the job. Take a lot of time [on your decision] because it's a lot of money. We called other mortgage companies to find out what universe of vendors they used.

BOULET: Don't automate existing [manual] workflow; re-engineer the process first and then apply the workflow technology.

WALLIS: Don't trust the vendors. A lot of them are promising things that are not even on the drawing board.

Instead, build expertise within your own organization, and let your own people design and build your workflow. Don't rely on vendors' "expertise," [especially in application development], which in many cases is not as robust as they would like you to think. It's worth the extra bucks to train somebody on your own staff.

The other thing is to read, read, read.

KESNER: Beware of the cost. Workflow is deceptive; it's more expensive than you think. You are going to have to invest in the database engine. For a truly comprehensive workflow-enabled system, you are going to have to buy seats for every user, which can be very expensive.

Don't underestimate the complexity with software interaction. Without a database dictionary and fairly rigorous control of nomenclature, you are going to be in trouble.

Lastly, you've got to get your IS people to think in very different ways. Users grasp this whole process very easily because it is all process-based, but it is very difficult for programmers who have grown up in a Cobol or AS/400 environment.

BRETT WALLIS

Lead systems analyst
Integron Corp.
Nonstandard automobile insurance carrier
Winston-Salem, N.C.

Uses workflow for claims processing. FileNet

software follows the claim from when it is re-

ceived through to the claims adjuster. Also for

controlling digitized mail through the company,

with client software generating some electronic

documents that are then routed throughout

the company.



FRANK MANCI

Document imaging
coordinator
Colonial Savings
Fort Worth, Texas

Uses ViewStar workflow

product to manage and track the mortgage loan

process. Colonial scans 40,000 loan pages a day

RESOURCES

ON-LINE

- http://www_is.cs.utwente.nl:8080/~joosten/workflow.html#whoswho. Listing of who's who in workflow research and links to key workflow sites on the World Wide Web.
- <http://planet.com/workmedia/wt/html>. On-line workflow journal.

CONFERENCES

- BIS Business Process & Workflow Conference 1996. Feb. 4-7, 1996. Lake Buena Vista, Fla. (617) 982-9500.

• Seybold Seminars (workflow automation). Feb. 27-March 1, 1996. Boston. Contact: Erin Gaffaney (415) 578-6947.

• Association for Information and Image Management show and conference. March 31-April 3, 1996. McCormick Place, Chicago (800) 447-2446.

• Groupware 96/Workflow 96. The Conference Group. May 12-17, 1996. Chicago (602) 443-4090.

GROUPS AND ASSOCIATIONS

- Workflow and Re-engineering International Association. Lighthouse Point, Fla. (305) 782-3376.

• Workflow Management Coalition. Brussels (011-32) 2 774 9633.

OTHER

- "Workflow Buyer's Guide" and "The Workflow CD-ROM Sampler." Creative Networks (608) 832-6647.
- Workflow market report and monthly newsletter. Delphi Consulting Group, Inc. (617) 247-1025.

Malloy is assistant researcher, Hunt is research analyst and Dix is a senior editor at Computerworld.

Senior writer Tim Ouellette also contributed to this report.

11:30 PM

Firm's working late on big project.
Network's humming along.

11:31 PM

Weird sounds from printer
interrupt your bliss.

GRRRUNK GRRUNK

11:32 PM

Realize you never learned those words
in fourth-year French.

11:33 PM

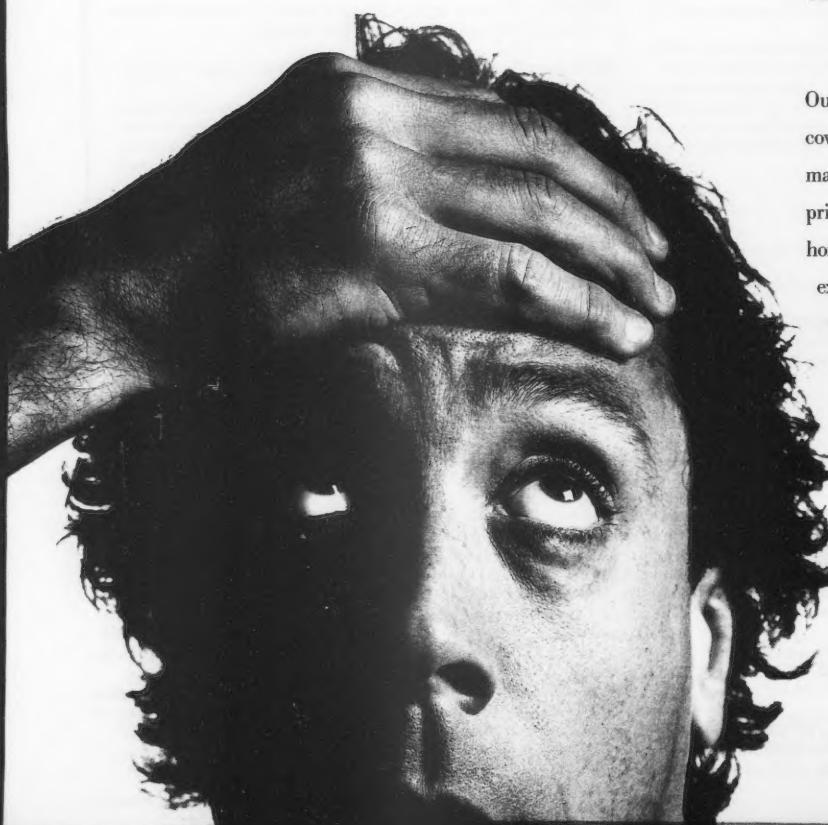
But you have IBM printers. You get IBM service.

11:59 PM

They translate over the phone. Printer's saying,
"Refresh my memory."

12:07 AM

Everything looks smart. Including you.
Thanks IBM.



Our printer specialists, master interpreters all, keep you covered 24 hours a day, 365 days a year. Their reliability is matched by that of our machines. From a 600-cps impact printer to a 35-ppm laser printer, we have just the work-horse to handle your client/server printing needs. Take, for example, the new IBM 4247 desktop matrix printer: With up to six paper inputs allowing for two different types of continuous forms, it allows users to consolidate their special-purpose printers and applications. For more on the kind of products and service you won't find anywhere else, call 1 800 IBM-3333, ext. IA032. Or find us on the Internet at printers@vnet.ibm.com



IBM

The IBM home page can be found on the Internet at <http://www.ibm.com> IBM is a registered trademark of International Business Machines Corporation. ©1995 IBM Corporation.



"Building world-class systems and products requires world-class Information Systems talent. ...Talent we find and hire by advertising in Computerworld."

*Don Desjardins
Recruiting Manager/Information Technology
MCI Communications Corp.*

"Just recently we hired 65 professionals from 510 responses generated by just one recruitment advertisement in Computerworld. With a qualified hit rate of 80%, Computerworld advertising generates enough responses to keep nine full-time recruiters busy."

With some 40,000 employees worldwide and revenues totaling over \$13 billion annually, MCI Communications Corp. has established itself as the nation's second-largest long-distance provider and one of the world's largest communications companies. The company's recent alliance with British Telecom further enhances its position to supply a vast array of telecommunication products and services to the global community. To ensure MCI's competitive edge in the communications marketplace both now and in the 21st Century, Recruiting Manager Don Desjardins advertises in Computerworld to recruit the best IS talent.

"The recent release of networkMCI BUSINESS and internetMCI are just two examples of the sophisticated, seamless communications products our software engineers are continually developing and introducing. Building world-class systems and products requires world-class Information Systems talent. In the networkMCI Services and Engineering groups, our culture demands that we employ only the best. It's this top talent we find and hire by advertising in Computerworld.

"In my mind, Computerworld is one of the best multi-platform, leading-edge information systems publications going. It covers every aspect of the IS world, and its readers are IS professionals with a variety of technical backgrounds. Since MCI's information technology group develops systems and products on a wide range of platforms, from open systems to large mainframes to the Internet, and recruits for extremely diverse technical environments, Computerworld is a perfect advertising fit. It is the industry-specific publication that targets all the top talent in all the right environments.

"Having just completed a three-year migration of our entire systems engineering group from Arlington, Virginia — one thing is certain: Computerworld recruitment advertising was a key element in successfully identifying and hiring qualified IS developers for Colorado Springs. Case in point, during 1994 our recruiters hired 1,124 technical professionals into systems engineering without paying a single agency fee. As a result, our cost-per-hire falls well below the industry average - thanks largely to our Computerworld recruitment advertising.

"On a regular basis, our information technology group is in the market to hire a full range of professionals - from entry-level technical IS recruits to senior network, database, and systems architects. Since we're highly selective, we look to our Computerworld recruitment advertisements to make all the right matches.

"The future is clear. To maintain MCI's telecommunications leadership position well into the 21st Century, we will continue to rely on recruitment advertisements in Computerworld to enhance our visibility and recruit the hard-to-find, high-quality technical professionals crucial to developing products and systems for our global customers."

For all the facts on how Computerworld can help you recruit world-class IS talent, call John Corrigan, Vice President of Computerworld's Professional Development Division, at 1.800.343.6474, x8201.

**1 800 343-6474
in MA 508 879-0700 x8201**

COMPUTERWORLD

Where the qualified candidates look. Every week.

P O W E R

Your career is knowledge.

Your knowledge is power.

Your power is your career.

<http://careers.computerworld.com>

Computer Careers

• POSITIONS AVAILABLE •

Salt Lake City, Utah

Utah offers great skiing, backpacking, water sports, National Parks, an excellent family environment, social opportunities and affordable living.

American Stores Company is one of the nation's largest retail grocery/drug chains, operating stores in 27 states as Lucky, Acme, Jewel, Sav-on, Osco, and Super Saver. The migration of our Systems Development Center to Salt Lake City has created career opportunities for qualified individuals with a minimum of 2-3 years' experience. Application experience in retail, warehousing, transportation, inventory, or finance is desired for some positions.

CONSULTING SYSTEMS ENGINEER

In-depth technical knowledge of theories, principles and practices applicable to retail systems. Experience providing corporate-wide technical direction. To originate reports and make technical decisions that are subjective, difficult to measure and require intensive interpretation. Develops new methods and procedures to optimize the use of ASC resources. (Job# CW-1030-CSE)

POS PROGRAMMER/ANALYSTS

Requires 2+ years IBM 4680/90 or NCR development experience and knowledge of business functions within a retail environment. 4680 basic coding and utilities or C or C++ coding background desired. (Job# CW-1030-PA)

In addition to an attractive compensation & benefits package, we offer a rare ground floor opportunity to join an established, growing company. To apply, please send/fax resume & salary requirements with a cover letter detailing your knowledge and experience to:



AMERICAN STORES COMPANY

Lucky • Acme • Jewel • Sav-On • Osco • Super Saver

EPS DEVELOPMENT MANAGER

Extensive retail EPS background, with industry contacts nationwide. Demonstrated skill as a technical innovator/visionary. 5-10 yrs. information systems development in an IBM MF environment. Solid in system development methodology, CASE, project team management and at least one DBMS. (Job# CW-1030-EPS)

DATABASE ANALYST

1-3 yrs. experience in database administration. 3-5 yrs. Sr. level application programming in an MVS environment, using CICS, IMS DC, SO, COBOL, and JCL. 2-3 yrs advanced usage of VSAM, SQL, DB2 and IMS DB. Strong RDBMS analysis and design skills required. (Job# CW-1030-DBA)

American Stores Company

Attn: IT Recruiter - Job#
PO Box 27447
Salt Lake City UT 84127-0447
FAX: (801) 320-4761

Equal Opportunity Employer

Florida

DON'T DREAM THE LIFE.
LIVE THE DREAM!!!

ROMAC is the largest search firm in the Southeast, with permanent and contract opportunities within Florida's premier information processing centers. We have positions for professionals with experience in any of the following:

- * NOTES NOTES
- * COBOL, CICS, DB2, IMS, DCS
- * POWERBUILDER, SYBASE, INFORMIX
- * ORACLE, FOXPRO, ACCESS
- * IEE, PCBASE, CASE TOOLS
- * OBJECT-ORIENTED
- * C/C++, SMALLTALK, VISUAL BASIC
- * UNIX, AIX, HP-UX, NOVELL, TCP/IP
- * BANYAN, WINDOWS-NY
- * AS400

Please indicate your preference for contract or permanent jobs.

ROMAC INTERNATIONAL
"The best and the brightest"120 West Hyde Park Place
Suite 200, Tampa, FL 33606(813) 251-2493 FAX
(813) 259-0738 24 hrs/day

Programmer/Analyst - Client sites in mid Chicago area & Co. loc. in Oak Brook, IL. Analyze, design, develop, implement & test applications running under OS/2, AIX, C/C++, Informix SQL, Solaris software on UNIX servers & Oracle. 40hrs/wk (8-5) \$45,000/yr. Must have prior of 2 yrs experience working permanently in the U.S. Send resume in dupl. to: Illinois Dept. of Employment Security, 101 South State Street, P.O. Box 1000, Chicago, IL 60605. Alt: Sheila Lindsey Ref # VIL 13408-L. NO CALLS. AN EMPLOYER PAID AD.

SENIOR PRODUCT ANALYST: Responsible for analyzing customer requirements, programming code changes to BASE24 hardware/software. Proven previous experience utilizing Tandem hardware and BASE24 hardware/software. Must have B.A./B.S. in Computer Science, 40 hours/week, \$37,000/year. Must have proof of legal authority to work in the U.S. Send your resume to Bernard Chiderton, Nebraska Department of Labor, P.O. Box 94600, Lincoln, NE 68509. Refer to job order #NE 0150409. This advertisement is paid for by the employer.

Software Engineer - 40 hrs/wk, \$40,000/yr. Development & maintenance of software for business applications. Development of database tools for software maintenance, support & data analysis. High level & detailed design of on-line/graphics portion of the project. Tools: C, UNIX, AIX, UNIX internals; shell programming, X-Windows; Motif, ADBASE, Oracle, Sybase, Informix, M.S. in Computer Science as well as 3 months as Programmer/Analyst or in job offered required. Previous experience in C, UNIX, X-Windows/Motif, GUI design, data modeling & database design using Informix standard edition. Send resume to job Service # Florida 2312 Gull Key Rd, Blvd. P.O. Box C, Clearwater, FL 34618-4090. Ref: order #FL-1323289.



UNLIMITED CHALLENGE!

Due to our continued success as one of the West's leading System Integrators, we have immediate openings for IS Project Managers, PAs, and Software Engineers incl:

Portland: IEF, DB2 (CICS and DBA), IDMS /APG3, Oracle, Sybase, PowerBuilder, Progress, OOP/GUI
BEST Consulting, 700 NE Multnomah #1100, Portland, OR 97232
(P/H) 503-236-5776 - FAX: 503-236-5784

Salt Lake City: PowerBuilder, Visual Basic, Delphi, C++, DB2/IMS, Cobol, CICS, Oracle Tools, Informix, SQL/Server, Access, RPG/SYNON
BEST Consulting, 1100 E. 6600 S., Suite 200, Salt Lake City, UT 84121
(P/H) 801-266-6138 - FAX: 801-266-0069

We know that **PEOPLE - NOT COMPUTERS** - are the keys to our success!

Our career-enrichment includes:

- * Career Growth
- * Loaded Perks
- * The Challenge of Diversity
- * Outstanding Quality of Life
- * Relocation Assistance
- * Training
- * Excellent Compensation
- * Continuing Education
- * International Travel Opportunities
- * Over a Decade of Sustained Growth
- * Fortune 500 Clients

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS...

Computerworld gives you large numbers of professionals who work in your industry.

When you're recruiting computer professionals, it's often important to find ones with experience working on systems specific to your industry. Computerworld's audience of over one half million is made up of the right people in every major industry.

INDUSTRY COMPUTERWORLD'S AUDIENCE

Information Systems "vendor" companies (includes consulting)

165,037

Computer Manufacturer	67,894
large-scale systems	36,446
mid-range systems	49,590
PCs/workstations	53,379

Software Vendor	100,012
large-scale systems	44,865
mid-range systems	82,722
PCs/workstations	61,517

Non-CPU Computer Products Manufacturer	24,401
--	--------

VAR/Dealer/Retailer

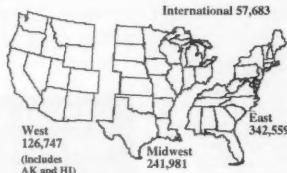
22,685

DP service bureau/contract	DP services	42,231
Consulting/Planning		75,019

Information Systems "user" companies and organizations

475,301

Manufacturing (not computers)	126,464
Insurance	69,501
Healthcare	76,548
Banking/Financial Services	83,985
Government	
Federal/State/Local	144,312
Business Service (except DP)	27,035
Communications Systems	31,729
Public Utilities	39,424
Transportation	6,735
Wholesale/Retail Trade	123,785
Education	70,764



For more information, call Lisa McGrath at 800-343-6474 x8201, in MA 508-879-0700.

Weekly. Regional. National. And it works.

An IDG Communications
Newspaper

SOURCE: Skill Survey of Computerworld's Audience, August 1994.

To place your advertisement regionally or nationally, call John Corrigan, Vice President/Professional Development Division at

800/343-6474 x8201
in MA 508/879-0700

COMPUTERWORLD

Where the qualified candidates look. Every week.

Notes 4.0 may send you back to class

Developers may like tools in latest release but face a learning curve

By Leslie Goff

The addition of an object-oriented scripting language and new user interface design options to Lotus Development Corp.'s latest Notes release will give developers greater flexibility and creativity in designing Notes applications. But developers certified in Release 3.30 should expect to climb a significant learning curve.

Notes Release 4.0 will be out later this year or in January, according to analysts. The differences between Releases 4.0 and 3.30 will be far greater than those between Releases 3.0 and 2.0.

LotusScript, an object-oriented programming language that many analysts compare to Microsoft Corp.'s Visual Basic application development tool, is being ported across Lotus' entire software suite.

Release 3.30 uses a macro language based on formulas and @ functions. Complex applications require developers to write to Notes application programming interfaces (API). "Instead of having a kludgy macro language, developers will have a much more powerful scripting language" with Release 4.0, says Matthew Cain, vice president of Workgroup Computing Strategies Service at Meta Group, Inc. in Stamford, Conn. "The Notes APIs have been encapsulated into a series of objects, so instead of writing to the APIs, you can write to higher-level objects."

Release 4.0 also will provide developers with a more diversified tool set and

user interface options, Cain says. Agent-based technology, for instance, will let developers write applications that alert end users when information of particular interest to them is added to a specified database.

Notes Navigator will make it possible to give users graphical representations of information, such as sales by region. Prior Notes releases could present information only in text format. Encapsulated database calls will make it easier for developers to give users access to outside databases.

"In some programming environments, the user interface is self-defined, so the developer doesn't have any control over the interface," says Ken Lownie, presi-

dent of Connexus Consulting Group in Andover, Mass. With Notes Release 2.0, users had forms and views. Release 3.0 added tools such as button capability, pop-ups and the ability to do internal and external look-ups.

"It will make it more challenging to be a good Notes developer because choosing the right tools and the right interface for an application will be even more of an art than it is today," Lownie says. "With Release 4.0, Notes becomes a richer environment, and as with any design challenge, the solution isn't to use all the tools but to use the right tools."

Lownie compares using the programming environment of Release 4.0 to the design capabilities of desktop publish-

ing. "In the hands of a bad designer, desktop publishing tools still don't work well. The more tools you have, the greater sense of an aesthetic you need," he says.

Lotus Authorized Education Centers will offer several courses for certified Release 3.0 application developers, and a few new Release 4.0 courses, when Notes 4.0 is first delivered to customers, says Terri Purinton, marketing manager at Lotus Education in North Reading, Mass. She can't confirm exactly when Release 4.0 will ship.

A general Applications Development Seminar will show developers how to convert a Release 3.0 application to Release 4.0 and add Release 4.0 functionality, Purinton says. Other seminars will cover the fundamentals of programming syntax, object-oriented programming topics and advanced application development using LotusScript. A complete list of Release 4.0 classes will be available in December. Self-paced, computer-based courseware also will be available.

In the meantime, Notes consultants say application developers who aren't already familiar with LotusScript or Visual Basic should start familiarizing themselves with both environments. "If you are a Visual Basic programmer, you have a huge head start on LotusScript," Lownie says.

"Notes 4.0 isn't going to change our jobs, but rather the tools we have to do the job," says Jack Rathmell, president of Collaborative Systems, Inc. in Cambridge, Mass.

Goff is a freelance writer in New York.

OF NOTE FOR ADMINISTRATORS

Among Notes Release 4.0's biggest selling features are streamlined administration and centralized management of the Notes environment, which includes the following features:

- **Administrative Control Panel**, a single graphical interface to manage users and groups, view message logs and manage several servers simultaneously.
- **Delegated Administration**, which centralizes Notes policy-making and control while assigning administration privileges or roles to groups of administrators.
- **Server Configuration Record**, which allows administrators to make changes to network servers regardless of geographic location.
- **Server Console Panel**, a single graphical interface that consolidates administration information and activities.
- **N&A and ACL Management Tool**, which automates the administration process for renaming and deleting users.

SUPPORT ENGINEER, PRODUCT SUPPORT SERVICES, JOB DESCRIPTION: Provides technical assistance and support regarding electronic mail systems and on-line support to wide area networks. Designs and implements software administration utilities and tools for customers using electronic mail systems, including Visual Basic, C, C++, COBOL, languages and Windows and Windows NT operating systems. **REQUIREMENTS:** Bachelor's degree in Computer Science, Mathematics, Physics or Math; 6 months of work experience in administration of computer networks and electronic mail systems, to include six months of work experience in a 12 month semester long or equivalent school project experience in programming or computer software development, utilizing C, C++, COBOL, and multi-tasking operating systems, object oriented programming techniques, and design and implementation of networking software, and graphical user interface software. Experience may be gained concurrently. **MUST HAVE LEGAL AUTHORITY TO WORK IN THE UNITED STATES**. **JOB LOCATION:** Irving Area Employer. **SALARY:** \$40,000-\$55,000 per annum, depending on experience. Work Schedule: Monday - Friday, 8 a.m. to 5 p.m. Application: Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O. #17X504226. Ad Paid by an Equal Opportunity Employer.

Software Development Manager: Will be responsible for developing TRITON manufacturing control system & business application modules for the North American market. Will supervise teams of software engineers, analysts & software engineers, & directly participate in Development Department's efforts to implement manufacturing/enterprise control system in accord with req's, to modify or write new code for existing system. Test North American TRITON system & business applications/modules as required. Will review, modify, & implement work req's by programmers, systems analysts, & software engineers, where necessary. Will act as support for internal Service Center for general manufacturing, including product planning, design, development, document management, maintenance, & support. Bachelor of Science in Computer Science or Computer Technology req'd. Must have a min of 5 yrs exp as software development manager or 5 yrs exp as programmer & systems analyst. Must have min of 4 yrs exp in design & development of manufacturing/enterprise control & related applications, including design of system with TRITON or Mantronix families of manufacturing/enterprise control systems. Must be able to program using 4GL, relational database & Unix. 4GL, relational database & Unix exp req'd. Must have min of 1 yr of exp. Must have minimum of 1 yr of project management exp. The position will require 40 hrs per week, 5000 hrs per year, and \$64,000 per yr. Applicants must send resume to 7310 Woodward Ave., Room 415, Detroit, MI, 48202. Reference number 160055. Employer paid ad.

Software Engineer needed for Telecommunications Services Firm in Atlanta, Georgia. Job duties include analysis, design, and development of software applications and maintenance of computer tools and techniques. Will determine client requirements, perform program coding, implementation, documentation and maintenance support. Will prepare technical reports, user manuals and instructional materials as required by clients. Provide on-site maintenance support to clients of various customized software packages including debugging, modification, fine-tuning and code organization. Will be required to use an IBM-3090 and AS/400. A specific environment will be cellular telecommunications industry applications. Will code in COBOL and use SQL, JDBC, LANSA, CL, Hawkeye, EZVIEW, and Extensible. Applicant must have a B.S. in Statistics Computer Science. A 10-year design degree is acceptable if determined to be equivalent by a recognized authority. In addition, the applicant must have 2 yrs. exp. in the post-during design engineer or as a Systems Analyst to include 2 yrs. exp. with AS/400, CL, LANSA, RPG 400, COBOL 400 and 1 yr. exp. in cellular building design. Must have 1 yrs. exp. Mon. Fri. 8 a.m.-5 p.m. \$47,267/yr. Send 2 resumes and cover letters (no calls) to: Georgia Department of Labor, Job Order #04A 59104, P.O. Box 3923, Woodstock Hills Road, Atlanta, GA 30329-3909 or the nearest Department of Labor Field Service Office. Must have proof of legal authority to work in the U.S. AN EMPLOYER PAID AD.

For 3 years SEI has specialized in SAP

We offer top rates, with medical and 401K benefits

Fax resumes in confidence to:

SEI
Attn: Skip Andrew
Fax 1-800-576-3558
Tel 1-800-576-0112
e-mail
72722.1664@compuserve.com

We have US & International contracts in:

• **SAP** - Functional & ABAP
• **Oracle** - Financials/MFG/ Sales & Distribution
• BAAN Triton / MANMAN X

Other contracts exist for:

• Oracle/Sybase DBA's
• Visual C++, MFC
• Windows NT / Win95 Developers

Pacific Northwest

PDG
Pacific Data Group

We have a proven track record of systems integration and information services consulting. Our 8 years of double digit growth and market leadership is due to our strong ethics, skilled employees and solid management.

PDG offers an attractive compensation and benefit package. For immediate consideration, mail or e-mail your resume to: Pacific Data Group, Inc., 10300 SW Greenway Road, Suite 230, Dept. C, Portland, OR 97233.

• DB2, CICS
• IMS DB/DC
• IDMS/DC
• IDIS/II
• COBOL, CSP
• Huron
• Natural/Abadas
• PowerBuilder
• Oracle 7/8/8i
• Oracle Forms
• Oracle Case
• Progress
• Sybase
• SQL Server
• SQL Windows
• HP3000
• AD/AD
• IEF, ADW

Don't gamble with your job search.
Use DICE.

DICE is looking for Data Processing, Engineering and Technical Writing professionals to fill open positions for companies nationwide.

DICE is a FREE online job search service, providing detailed information about current contract and fulltime positions across the USA. Please contact by calling ANY of these access numbers, using your computer & 1200-9600 baud Modem, 8-N-1.

California 408-737-9339
Georgia 404-523-1341
Illinois 708-782-0960
Iowa 515-280-3423
Massachusetts 617-266-1080
New Jersey 201-242-4166
Texas 214-691-3420
Internet telnet dice.com

**DATA PROCESSING
INDEPENDENT
CONSULTANTS
EXCHANGE**



A Service of D&L Online, Inc. (515) 280-1144

PROGRAMMER ANALYST [2 openings] (Ref. 167795) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients; needs; systems analysis, design, development, unit testing, sys testing of business applications using Unixy 4GL LINC II on Unisys A-Series & U-Series machines. Duties include use of LINC II, DMS II, WFL, DMINQUITY, ERGO & other related software to create, transform, maintain, & update business sys & use IBM mainframe & COBOL. Req. Bach. in Comp. Sc., Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis, Mathematics or its equivalent in ed. & exp. & 2 yrs. exp. in 200 offerings of sys, related exp. as a Programmer, Analyst, or Systems Analyst, or equivalent experience as a Systems Analyst or Consultant. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of 3 yrs. college ed. & exp. Must have some related exp. including design & development of LINC based sys & use of each of the following: Unisys A-Series, Unisys U Series, Unisys U Series & COBOL. \$43,500/yr. 40 hrs/wk. 8:00-5:30p.

FINANCIAL APPLICATIONS PROGRAMMER

KCI's Information Systems department is in the process of implementing an integrated financial system. To support this project we are seeking a **FINANCIAL APPLICATIONS PROGRAMMER** who also understands technical aspects.

Required: * Bachelor's degree in Computer Science or a related field
* Minimum of two years programming experience

- Minimum of two years programming experience in a financial/accounting environment
- Experience with relational database in a UNIX environment & thorough understanding of SQL

10.5G & PowerBuilder background a plus.
Please express your interest by faxing or sending your resume, specifying position applying for and salary requirements.

quirements, to:
KCI

KCI
Human Resources
Attn: Michele
P.O. Box 659508

P.O. Box 305000
San Antonio, Texas 78265-9508
FAX: 210-308-3992

KCI maintains a drug-free workplace.

We are an equal opportunity
KCI Jobline (210) 524-9779

THE JOURNAL OF CLIMATE

ANSWERABLE 9

COMPUTERWORLD Oct 1995

Every week
Computerworld
delivers more
qualified
job candidates
than any
other
newspaper.

**That's
why
more
companies
place more
recruitment
advertising in
Computerworld
than in
any other
specialized
business
newspaper.**

Computerworld

To place your
advertisement,
call Lisa McGrath at
800-343-6474
x8201
in MA 508-879-0700

Weekly. Regional. National. And it works.

An IDG Communications Newspaper

Computer Careers Midwest

105

Programmer Analyst - Design, development and maintenance of software for medical imaging system in C, C++ using X-Windows, MS-Windows and TCP/IP, SPX/IPX based client server architecture under UNIX/OS/2/Windows operating system; development of local area/wide area network interface to external devices; requirements analysis, system requirement analysis, specification development, implementation and installation, interaction with customer, problem resolution, documentation, provide support to marketing group and vendor new product evaluation; determine new technologies and products for medical imaging. Bachelor's degree in Comp. Science, Systems Analysis, Comp. Science Systems, Comp. Science, Electrical Engg., Electronic Engg., Mathematics or its foreign equiv. 2 yrs. exp. in job offered or 2 yrs. exp. in related occup. as Programmer, Software Engineer, Sys. Analyst, Softw. Eng. Engineer, Senior Sys. Eng. or Consultant must have 1 year related exp. in design, development & porting on SUN Sparc, HP Apollo and IBM Risc based systems using each of the following: X-Windows, C, C++, C++, Oracle, RPG/400, Unix internets, TCP/IP, and RPC. \$43,415/yr., 40 hrs/wk., 9-5p. Send resume to: 7310 Woodward Ave., Rm. 415, Detroit MI 48202, Ref. #163895, "Employer Paid Ad"

ROMAC INTERNATIONAL
The Best & The Brightest
ROMAC, a leading national supplier of medical imaging equipment, has outstanding contract and permanent Information Technology opportunities in Chicago land.
Applications Developers
VISUALBASIC - LOTUS NOTES
POWERBUILDER
SQL ENTERPRISE
COROL, DB2 or IMS, CICS
C/C++, UNIX, MS WINDOWS
SYBASE, ORACLE, INFORMIX
Network Engineers/Administrators
ECNE, CNE - BANYAN
WINDOWS NT
System Administrators
HYPERION - LAWSON - R/3
FOURGEN - PEOPLESOF
Credit card applications
Mail, fax, or email your resume to:
ROMAC Information Technology
20 North Wacker Drive
Chicago, Illinois 60606
312-263-0902
FAX: 312-263-3023
email: desiree@romac.com
An Equal Opportunity Employer

Software Engineer: Codes, tests, designs, develops, and modifies a medical system software package using C, C++, and UNIX. Work flow for purposes of cardiac analysis. Will use higher physical mathematical calculations and permutations of data. Data will be stored in a relational database into 3-D imaging for use in medical analysis. Will perform interface design and create Object-Oriented Programs to be implemented in a Graphic User Interface. Will use Windows or a X-Windows or Motif format. Will insure that software performs fault free data acquisition analysis and processing. Will use C, C++, and UNIX image software for medical systems development. All work will be performed in a UNIX environment using C, C++, UNIX, and SGI workstations. Requires Master's degree in Computer Science, Math or Physics. Also requires 2 years experience in the job to be performed or two years experience as a Project Analyst. Education and experience in the design of a project in which the individual modified at least two programs in three dimensions using holographic imaging using X-Windows or UNIX from higher physical mathematical calculations. If experience in related field, experience must include programming and analysis to perform higher physical mathematical calculations using C and C++. Work will be performed on a SUN or SGI workstation for relational database. Hours: 8:00 a.m. - 5:00 p.m. \$22.00hr., 40 hrs/wk., 9-5p. Send resume to: 7310 Woodward Ave., Rm. 415, Detroit MI 48202, Ref. #163895, "Employer Paid Ad"



Outboard Marine Corporation, a leading global manufacturer and marketer of marine engines (Johnson & Evinrude brands), boats and accessories, is currently expanding its Information Systems & Technology group. We have an unprecedented opportunity to accelerate our systems efforts and launch new **WORLD CLASS** systems for the future.

Multiple, newly created positions are available in each of the following areas:

- Systems Development
- PC's, LANS, Network Support
- Computer Operations
- Telecommunications

We are seeking to fill the following positions:

- Project Managers
- Analysts
- Programmers
- Computer Operators
- Telecommunication Analysts
- PC & Network Specialists

Development/implementation of new system applications will encompass all business areas: Manufacturing, Engineering, Logistics, Marketing, Sales, Financial, and Human Resources.



Our development & operational computer environments include a variety of platforms from mainframes thru mid-ranges to local area personal computer networks:

MVS/ESA	COBOL
UNIX	COBOL II
OCL	RPG II
OS400	CICS Command Level
DOS	IDEAL
WINDOWS	FOCUS

Quick Basic
Visual Basic
C++
PowerBuilder
Novell
Perfect Office
Groupwise

Outboard Marine is a 1994 and 1995 recipient of *Computerworld's* "Best Places to Work" award in recognition of its training, rapid-development, and teamwork environment. Successful candidates must have proven track records of being: start-ups, enthusiastic, energetic team players, excellent interpersonal/presentation skills, as well as strong customer orientation. Client-Server experience a plus.

Only those candidates willing to put forth the necessary effort to rapidly achieve **WORLD CLASS** status need apply. Please direct all responses to:

OMC Human Resources Department
100 Sea Horse Drive
Waukegan, IL 60085
Equal Opportunity Employer M/F

Fax: 708-689-5220



Results.

Computerworld gives recruitment advertisers results. Weekly. Regionally. And Nationally.

To place your advertisement, call Lisa McGrath at 800-343-6474 x8201, in MA 508-879-0700.

Weekly. Regional. National. And it works.

An IDG Communications Newspaper

Systems Engineer to perform analysis and design of an integrated Manufacturing and Assembly System. Responsible for process and data flow design, manufacturing, assembly, and design of system and design of application and meeting with users to gather requirements; provide technical support for design and development of system. Must have 5 yrs. exp. in design, development, and implementation of system using IBM 3090 using the following hardware, software and languages: IBM 3090, MVS/ESA, VMS/VM/CMS, CICS, DB2, COBOL, C, C++, II, AIX, UNIX, VSAM, JCL, JES-2, SDF, VTM, TSO, CLIST, XPL, PENTER, REXX, JCL, RECON, DOS, MVS/ESA, OS/2, MS-DOS, FTP, NOVELL Netware, WORD PERFECT and LOTUS. Regs: Bachelor's degree in Electrical Engineering or foreign educational equivalent; 2 yrs. exp. in job offered or 2 yrs. exp. in related occup. as a System Engineer. Must have related experience including use of each of the following: IBM 3090, MVS/ESA, CICS, DB2, COBOL, AIX, UNIX, VSAM, JCL, RECON, and UNIX. \$43,415/yr., 40 hrs/wk., 8a-5p. Send resume to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202, Ref. #163895 "Employer Paid Ad"

Technical Support Coordinator

For campus-wide support of computer hardware/software. Req. A B.S. in computer science or a related field with five years professional experience and three years Network 3.11 or 3.12. Technical skills writing software programs and microsupport IBM PC and Mac. Supervisory experience preferred. Salary to \$42,000 depending on qualifications. To be considered please submit resume, salary history and telephone number with three entries referencing by 11/29/95 to Stan Clark, Director of Human Resources, Indiana University Kokomo, P.O. Box 9003, IN 46904-9003. EOE.

Information Technology Professionals

Entergy, one of the nation's largest electric energy companies and a leader in the utilization of evolving technologies, is currently seeking world class professionals to join us in our New Orleans based facilities. Positions require a BS in Computer Science, Mathematics, Engineering or equivalent work experience, excellent verbal and written communication skills.

Please send or FAX your resume, including salary history to:

Energy Services, Inc.
Human Resources
P.O. Box 61000
New Orleans, La 70161
FAX:(504)576-4428

Principals only. EOE, M/F/D/V
You will not be contacted unless you are considered for an interview.

DATABASE ADMINISTRATORS - Responsible for the design, development and support of a heterogeneous, cross platform DBMS environment. Functions include: control block/component generation, database/gateway performance monitoring and tuning, logical and physical database design, database integrity verification, data access strategies, and disaster recovery planning. SQL and relational theory a must. Experience with Sybase, ORACLE or DB2 preferred.

DATA WAREHOUSE DESIGNERS - Responsible for logical data modeling; identification of source data; definition of extraction, transformation and loading logic; implementation of data subjects. Requires experience with RDBMS in relational theory, SQL, data modeling techniques, and CASE tools. Exposure to Sybase, ORACLE and/or DB2 preferred.

APPLICATION DEVELOPMENT (Multiple Positions) - Skills and experience required: Windows-based, client/server development using Oracle or Sybase RDBMS, GUI development tools (PowerBuilder, Oracle forms), and/or C. Analysis and design using structured methodologies and CASE tools. Large system development. Oracle financial application package & document management/imaging desirable.

CONFIGURATION MANAGEMENT - Requires experience in technical data processing with knowledge of large scale distributed client/server technology, application development methodologies, project management and quality assurance methodologies.

TELECOMMUNICATION ENGINEERS - Requires experience in designing, planning and providing strategic planning for wireless communications systems including Specialized Mobile Data Radio (SMDR), analog cellular systems, CDPD systems, PCS, Satellite and 1 and 2 way paging systems. BSEE and 5 yrs experience in telecommunications field. Focused in ATM and high speed data communication fields.



CONSULTANTS

SPEAK UP

and you'll be heard across the country and throughout the industry! SEEK Consulting is a rapidly growing, full-service contract placement firm — and when you speak, we listen. As market savvy staffing specialists, we actively promote the interests of the companies we work with and the consultants who work with us. Whether you're a hiring manager in need of a network of technical talent, or a career minded systems professional seeking a wide range of challenging assignments, think of SEEK Consulting as your partner — your voice in today's marketplace.

SEEK

Current Contract Opportunities:

- Oracle Financials
- Progress V7, UNIX
- PowerBuilder, Oracle
- Visual Basic, Access or SQL Server
- Smalltalk, Digital
- OS/2, Real-Time, IBM Tools
- Oracle, Sybase DBA's, Developers
- SAP R3
- ATM Real-Time Embedded
- DOS/Windows Driver Development
- Novell, LAN
- HP-UX System Administration
- Lotus Notes Developers
- UNIX Device Drivers, SCSI
- C++, SNMP, MIB Development
- Oracle/Sybase, ODBC



- Windows, OLE, DDE, NT
- SQL Windows, C, C++
- C, C++, S37, ISDN
- VCB, OpenMP, cc, mail
- VC++, Windows, MFC
- HP OpenView
- MS Mail Administrator
- NT Porting, Sun, C++
- C++, Windows, XVT
- Real-Time Embedded S/W, 68HC11 or 68302
- C++, Device Drivers
- Firmware, ROM
- UNIX System Admin.
- Windows '95 Beta Testers
- Oracle CASE Designers

Opportunities available throughout the U.S.

Enjoy all the advantages of partnering with SEEK, including our state-of-the-art SCREAM™ database. Stop searching for the perfect position — instead, SEEK ongoing opportunities by sending your resume to: SEEK Consulting Group, Inc., Attn: Dept. CW, 401 Edgewater Place, Suite 130, Wakefield, MA 01880; Phone: 1-800-274-1174; Fax: (617) 246-8246; Internet: jobs@seekcon.win.net

SEEK CONSULTING

CONSULTANTS

Immediate Interviews

MAINFRAME

- DB2/DCS
- DB2 or CICS
- Natural 2
- Oracle
- Lotus/Notes
- DB2/DBTG
- ADW or IFP
- BAL
- HOGAN
- APPS
- QMF
- SAP

CLIENT SERVER

- Lotus Notes
- PowerBuilder
- Informix
- OLE 2.0
- Oracle
- Lotus/Notes
- DB2/DBTG
- DB2/DBTG
- Sys/Admin
- PeopleSoft
- Windows NT

Rohn Rogers Consulting

550 No. Rose Street, Suite 300
Tampa, FL 33609-1013
Alm. Rich Michaels
913-570-5034 Fax 913-287-5179

or
1212 6th Ave. 9th Fl. NYC 10036
800-421-5158 Fax 212-921-1319
Fax 212-302-4363
email: 00801@juno.com

DATABASE EXPERTS

Relocating or seeking greater challenges? We have outstanding permanent positions across the USA for DB Developers. If you are experienced with a good work history, send resume ASAP for prompt consideration.

Sr. Corp. DB Expert to \$75k
Multiple DB2 experience required for new technology planning & integration

C/S Oracle DBA to \$60k
Locally NEW ENGLAND setting & low cost of living. Establish Oracle support for multiple DB environments

DB2/DBA to \$55k
Join Oracle & Sybase team as DB2 expert Logical & physical design

HAMILTON
TECHNICAL PERSONNEL, INC.
P.O. Box 2559 West Hartford, CT 06148
914-679-4050 Fax: 914-679-5704
email: ht@mhk.net

IMS SYSTEMS PROGRAMMER

Federal Reserve Automation Services (FRAS) is a leading provider of centralized mainframe support and network services for the Federal Reserve System. Currently, we have an excellent opportunity available for an **IMS SYSTEMS PROGRAMMER** at our Richmond, VA site.

The qualified candidate will be the top level technical contributor in IMS online systems programming, providing technical consulting on complex operating software programming. Additional duties may include instructing, directing, and verifying the work of other operating system programming personnel.

We require detailed knowledge of IMS/TM and MVS/ESA mainframe and peripheral hardware operation. Detailed problem-solving skills including dump reading, debugging, and Assembler language essential. Knowledge of design, coding, implementation, and maintenance of IMS/TM, as well as experience with IMS, ACO, AOC, IMS/AO, IMF, IMF/AO, OMEGAMON/MVS, and OMEGAMON/IMS operation required.

In return, we offer an excellent salary and benefits package, including relocation assistance. Beginning Friday, Nov. 3, see us on the web at <http://www.monster.com> in employer profiles, or for consideration, please send, fax, or E-mail your resume with salary history to: **Betsy Garrison, FEDERAL RESERVE AUTOMATION SERVICES, Dept. CW1030, P.O. Box 27622, Richmond, VA 23261. FAX# 804/697-8490. E-Mail: elmeg02@Rich.FRB.org. EOE**

MF/D/V.

FR AS
FEDERAL RESERVE AUTOMATION SERVICES

ARE YOU READY FOR THE FUTURE?
THE FUTURE WILL BE...AMD!

Advanced technology and state-of-the-art facilities are the tools. Your talent, experience and innovation will determine what the future will be at AMD. We are currently hiring for the following outstanding positions:

- Unix Systems Administrator/SAP/Oracle
- Senior Programmer Analyst - Intercompany Communications
- Manufacturing Systems Engineer - CAD Databases and Workflow
- IS Section Manager/IS Technical Support - Data Warehouse
- Senior Systems Programmer/IS Technical Support
- Systems Programmer/IS TTS Technical Support
- Project Manager/Analyst/Strategic Systems - SAP
- Manager Distribution Systems - Business Application Development
- Software Engineer 2/CFO IS NCSS Operations System Support
- IS Analyst 2/Technical Support - VAX/VMS - Cobol
- IS Project Manager/Strategic Systems - Entrepreneur
- Senior Business System Analyst/Finance - SAP

Send your resume to: AMD, Professional Staffing Dept., One AMD Place, P.O. Box 3453, M/S 935/CW103095, Sunnyvale, CA 94088-3453. Fax Sunnyvale, CA at (408) 774-7024. AMD is an equal opportunity employer. Access our web site at: <http://www.careermosaic.com/cm/amd/>

Advanced Micro Devices

At New River Technology
Our Employees Come First!

At NRT we are striving to build the ultimate integration and consulting firm in the world! To do that we want and need the best team possible. To address this monumental challenge we have decided to do things that are unique and exciting! All employees of NRT go through our internal employee development program (which includes training, mentoring), part of our management teams review/compensation is based upon your success in this program. In addition, we offer comprehensive benefits/compensation and best of all we plan on offering our employees a stock purchase plan in NRT so that what you help build today will be there for you in the future. We currently have openings in our Raleigh, NC and West Palm Beach, Florida offices for the following individuals:

- **HP/3000 Programmers** - (Charlottesville, VA) We need some strong programmers with Powerhouse or someone with a strong COBOL background.
- **AS400/SYS. 36 Sr. Programmer/Analyst** - We need some strong P/A's to work on a long term Mfg./Distribution project.
- **Oracle Programmers/Developers** - We need some strong P/D's to work on a long term Mfg./Distribution project.
- **Oracle Project Managers** - We need some strong mfg expertise to join our booming Vertical Mfg. area!
- **Oracle DBA's** - We need some strong DBA's w/manufacturing and financials.
- **Powerbuilder Developers** - (Florida Office) - join our rapidly expanding Powerbuilder group. We will also assist in helping you obtain your advance certification.
- **Informix Programmers/Developers** - We need some strong P/D's to work on some new up and coming projects.
- **C Programmers** - We need some strong Programmers with an Oracle background to work on long term Mfg./Distribution project.

This type of opportunity doesn't come around often! If you feel that you bring the unbending quality to NRT that we expect then we want to talk. Please call Robert Gable at (919) 233-8845 or Fax your resume to (919) 233-1340 or mail to NRT - 1215 Jones Franklin Road, Suite 103, Raleigh, NC 27606, ASAP.

NR NEW RIVER
TECHNOLOGY

Join The High Productivity (HPS) Team at SEER.

Seer Technologies is the international leader in ultra-modern system development technology. Our flagship product, the Seer[®]HPS™ Environment, is a fully integrated object-oriented, repository-based applications development tool that gives us a significant edge in today's multi-platform complex client/server market. Due to our unprecedented growth, Seer is urgently seeking dynamic candidates for positions in domestic and worldwide locations as:

Consultants/Senior Consultants/ Developers/Technical Trainers

We require a minimum of 4 years of applications design and development experience, with a high degree of technical proficiency and knowledge of:

- Business Process Re-Engineering
- Consulting
- Data Process Modeling Techniques
- Information Engineering
- Object-Oriented Methods
- GUIs
- Project Management
- Event-Driven Design

Ideal candidates will possess strong consulting skills in client/server, methodology, networking and/or systems security. IBM mainframe, UNIX, or DOS/Windows background (IMS DB/DC, MVS, TSO, COBOL, DB2, CICS, ORACLE, SYBASE, TCP/IP, MOTIF, Presentation Manager); CASE; excellent communications skills; and a related undergraduate degree are essential. Travel will be required.

Extensive training in HPS development will be provided. Seer offers excellent career potential, competitive salaries and comprehensive benefits. For immediate consideration, please send your resume and salary history in confidence to: Lori Laubach—HR, Seer Technologies, Inc., 1000 Regency Parkway, Cary, NC 27511; FAX (919) 469-1925. No agencies or phone calls, please. Seer is an equal opportunity employer.



We've been there.

Internet Products Development

Our GranNet, WebMacker and VNS products are cutting edge on the Internet! We have career openings for the following:

Macintosh Programmers

- Requires BS in Computer Science, related field, or equivalent experience
- 2+ years commercial software development experience in C/C++
- Requires GUI development experience using the Macintosh Toolbox
- AppleEvents and TCP/IP programming a plus

MS-Windows Programmers

- Requires BS in Computer Science, related field, or equivalent experience
- 3+ years commercial software development experience in C/C++
- 2+ years GUI development experience using Windows 32bit SDK
- OLE and WinSock programming experience a plus

Customer Service Representative

- Requires BS in Computer Science, related field, or equivalent experience
- Experience in MS Windows, NT, Macintosh, and Unix environments
- 3+ years commercial software customer support experience
- 3+ years commercial software testing experience
- 3+ years commercial software customer support experience
- A fundamental knowledge of the Internet, WWW, Client/Server software

Send resumes to:

The FrontDoor Group, Inc.
1360 Post Oak Blvd., Suite 1149
Houston, TX 77056
Fax: 713-961-1149
Internet Home Page: <http://www.fg.com>
Equal Opportunity Employer

Results.

Computerworld gives recruitment advertisers results. Weekly. Regionally. And Nationally. To place your advertisement, call Lisa McGrath at 800-343-6474 x8201, in MA 508-879-0700.

Weekly. Regional. National. And it works.

An IDG Communications Newspaper

**T
E
K
M
A
R
K**

- SYSTEM ENGINEERS w/
Telephony exp. and any of the following:
FRAME RELAY, ATM, SONET, SNMP,
NMA, OSI, SS7, AIN or SWITCHING
- UNIX OR MS WINDOWS TESTERS
- BUSTER, SOA TEST, SOA ROBOT, QA
PARTNER, X RUNNER, MS TEST, MYNAH,
NAME, SABLE, or SABLE
- UNIX/C, UNIX/C++ with any of the following:
ODD, XWINDOWS, MOTIF, TCP/IP, CMIP/CMISE,
GALAXY, SYBASE, ORACLE, OBJECTSTORE,
OPENVIEW, or NETWORK MGMT
- SYSTEM ADMIN: HP, UNIX, SUN, or WINDOWS NT
- VISUAL C++, SMALLTALK, GENTRAN/EDI, IEF,
STRATUS

Please call, fax, or send resume to:
TEKMARK Computer Services, Inc.
100 Metroplex Drive, Suite 102
Edison, NJ 08817

(908) 572-5400
(212) 686-9360
FAX: (908) 572-7117



Looking for software development experience?

Computerworld's readers have it!



Skill	Product category	Reader's who've worked with product
Access	data management/DBMS	120,063
Adabas/Natural	data management/DBMS	22,065
C++	language/GUI*/utility	137,056
CA-Datacom/DB	data management/DBMS	5,332
CA-IDMS	data management/DBMS	66,520
DB2	data management/DBMS	165,383
dBase	data management/DBMS	257,769
DL/1	data management/DBMS	71,912
Ethernet	LAN**	248,973
FoxPro	data management/DBMS	142,757
Gupta/SQLBASE	data management/DBMS	26,507
Ideal	data management/DBMS	2,526
IMS	data management/DBMS	109,619
Informix	data management/DBMS	46,748
Ingres	data management/DBMS	29,313
Inquire	data management/DBMS	2,526
Model 204	data management/DBMS	8,114
NETVIEW	communications	98,758
Object Database	data management/DBMS	6,430
Objectview	development/CASE [†] tool	21,985
Oracle	data management/DBMS	134,106
Paradox	data management/DBMS	176,340
PowerBuilder	development/CASE [†] tool	86,026
R:BASE	data management/DBMS	67,362
RDB	data management/DBMS	16,453
Smalltalk	language/GUI*/utility	11,537
SQL	language/GUI*/utility	177,484
Superbase	data management/DBMS	8,395
Supra	data management/DBMS	8,114
Sybase	data management/DBMS	51,659
System 1032	data management/DBMS	1,123
Total	data management/DBMS	23,163
Uniface	data management/DBMS	1,964
Unify	data management/DBMS	12,664
VAX DBMS	data management/DBMS	39,732
Visual Basic	development/CASE [†] tool	197,697
VSAM	data management/DBMS	192,909

* Graphical User Interface

** Local Area Network

[†] Computer-Aided Software Engineering

SOURCE: Skills Survey of Computerworld's Audience, August 1994.

For more information, or to place
your recruitment advertisement,
call 1-800-343-6474 x8201.

COMPUTERWORLD

Client/Server Edition up to enterprise

Software Engineer, to analyze, design and implement database applications using formal object-oriented methodology to develop Oracle and Informix database applications, especially for X-Windows based graphical (imaging) products. Responsible for: database administration and analysis, performance issues, computer graphics modeling, and providing/ implementing object-oriented solutions in C++, 40 hours per week, M-F, 8 am to 5 pm. \$30,000/annum. Job in Tampa, Florida. Requires: MS in Computer Science and 2 years' exp. either in the job offered or as Data Analyst, Application Software Engineer, or Software Engineer (Concentrator) in Database Development and Management. Experience in Oracle non-relational environment and must include database and graphics products development in Oracle. Database design and programming required. Experience in administration. Graphics/image systems development using X-Windows and implementation of display algorithms, rendering algorithms for 3D graphics imaging. Object Oriented design/ modeling and implementation using C++. Travel upto one month per year. Minimum U.S. travel may be required. Send resume to Job Service of Florida, 2312 Gulf-to-Bay Blvd., P.O. Box C, Clearwater, FL 34610-0090. Re: Job Order # FL-1323554.

3-YEAR CONTRACTS UP TO \$50/Hr.

Contract positions available immediately in FL, MS, GA, AL, IL, VA & CA. • ADABAS/NATURAL II • IMS, DB/DC, COBOL • UNIX, ORACLE, C, PRO C • POWERBUILDER • VISUAL BASIC, ORACLE • VISUAL BASIC, COBOL • PROGRESS • UNIVIS A Series, ALGOL • UNIVIS A Series, LINC • UNIVIS MAPPER • JPS, Inc., P.O. Box 692281 Houston, TX 77269-2281 Phone: 800/633-0391 Fax: 800/963-3039

TANDEM

COBOL, PATHWAY/TAL, SCOBOL/C, LINC/X.25

STRATUS

PL1, COBOL/C, ON2, MUMPS, UNIX

SUN, HP, RS/6000, GUL, SOK, PDP11, VME, VMEbus, Basic, Fulltime/Consulting Positions available in the US/ABROAD

STRATEM

800-582-JOBS

TEL (212) 967-2910

FAX (212) 967-4205

124 W. 30th St., Suite #302 New York, N.Y. 10001

Computerworld recruitment advertising works!

That's because more computer professionals read more recruitment advertisements in Computerworld than in any other newspaper. For more information or to place your advertisement, call Lisa McGrath at 800-343-6474 x8201 (in MA, 508-879-0700).

COMPUTERWORLD

Weekly. Regional.
National.
And it works!

CONTRACTORS

♦ INFORMATION SYSTEMS ♦

- ◆ SAS PROGRAMMERS
- ◆ LOTUS NOTE ADMIN: PATHWORKS
- ◆ LOTUS NOTES DEVELOPERS
- ◆ HTML DEVELOPERS
- ◆ ORACLE V7 PROGRAMMERS/PL/SQL
- ◆ ORACLE V7 PROG/PL: SQL, PERF. TUNING
- ◆ ORACLE DBA
- ◆ NE TWK EXP., PATHWORKS, SERVERS, C/S
- ◆ PC SUPPORT, PATHWORKS, MS-OFFICE
- ◆ PC SUPPORT, NOVELL, MS-OFFICE
- ◆ WAN, TCP/IP, ETHERNET
- ◆ CC:MAIL, SERVER EXPERIENCE
- ◆ CC:MAIL, EXPERT
- ◆ HURON DEVELOPER
- ◆ SYNCH DEVELOPER
- ◆ UNIX SYSTEMS ADMINISTRATOR
- ◆ SYBASE DEVELOPER
- ◆ VISUAL BASIC, C++ PRODUCT DEVELOPER
- ◆ VISUAL BASIC, ACCESS APPS DEVELOPER

♦ SOFTWARE ENGINEERING ♦

- ◆ MAC, METROWERKS/CODE WARRIOR, C++
- ◆ WINDOWS 95, VISUAL C++
- ◆ VISUAL C++, WINDOWS NT, FINL SERVICES
- ◆ ODBC DRIVERS, NT
- ◆ VISUAL C++, 32-BIT MULTIMEDIA
- ◆ VISUAL C++, WWW FUNCTIONALITY
- ◆ OLE 2.0, VISUAL C++, OCX
- ◆ C++, NT TO OS2 PORT
- ◆ NT PERFORMANCE FUNCTIONALITY
- ◆ C++, OS2
- ◆ BORLAND PASCAL, DELPHI, OWL
- ◆ VISUAL C++ BROWSER CUSTOMIZATION
- ◆ UNIX
- ◆ MOTIF, C++ [JUNIOR/SENIOR]
- ◆ C, AIX INTERNALS [KERNEL]
- ◆ INTERNATIONALIZATION
- ◆ DOUBLE-BYTE ENABLING [DEV. & QA]
- ◆ TECHNICAL TRANSLATORS/LINGUISTS

Winter, Wyman ♦ Contract Services

PLEASE CONTACT MARK REED:

617-890-7007 EXT. 3016
800-890-7002 OUTSIDE MA
FAX: 617-890-4433

EMAIL: CONTRACT@WINTERWYMAN.COM
204 SECOND AVENUE, DEPT. CW
WALTHAM, MA 02154-1126

EXPLORE MORE JOBS: <http://www.winterwyman.com>

Analyst, Multiple Airline Interface for cruise line industry; Will be the primary analyst and team leader in charge of the Multiple Airline Interface (MAI) and Air Management System. Will be responsible for the system study and design which includes understanding of the system from a business perspective. Will analyze user requirements and system requirements specifications. Will be responsible for software development and integrated system testing. Will provide the necessary support (functional and technical) through implementation and post-implementation. Will communicate with the related user departments. Will provide supportive services to over 185 MAI users. Will work with Sabre, Syntel, OnTime, Syntel, Syntel development using RPG/400, Control Language, SQL, SQL, Ease and work with the IBM AS/400 and IBM PS/2, OS/2 environments. Also will also be DB 2, APPC/COBOL communications. 40 hour week, 9AM to 6PM. Salary is \$48,000 per year. Bachelor of Science or equivalent in computer science/electronics or related field. 2 years experience in job offered. 2 years as software engineer or software consultant. Will supervise 2 employees. Submit resume only to: Job Service of Florida, 701 SW 27th Avenue, Room 47, Miami, FL 33135. Re: Job Order No. 1324143.

SYSTEM ADMINISTRATOR

in OREGON

- System/Unix Oracle
- IEF Integrated Case
- Client/Server
- Windows NT LAN
- 700+ workstations

Two years experience inst/main of Unix/Oracle. Responsibility for project monitoring, coordination and program evaluation

Skills in planning, project management and implementation.

1805 Sardis Rd. N. #103 Charlotte, NC 28270 Phone: 704-841-1135 Fax: 704-841-1173

1805 Sardis Rd. N. #103 Charlotte, NC 28270 Phone: 704-841-1135 Fax: 704-841-1173

Your FUTURE,
your CALL.
Make it.
[1-800-660-9570]

For over 25 years, RHOTECH has been the premier provider of technical personnel because people like you put us there. We promise you an exceptional compensation and benefits package, an exciting working environment, great advancement opportunities, and the chance to stay current with the developments in your field. With 9 offices nation-wide providing technical resources to Fortune 1000 companies, RHOTECH holds your next career challenge. Positions available-

Systems Engineers	Developers/Programmers
Systems Managers	-Oracle
PC Support	-DBA
Networking	-CICS/Cobol
Computer Operations	-Sybase
IS Managers	-DB2
Client/Server	-DEC Pathworks
	-AS/400
	-C/C++

RHO TECH
PROFESSIONAL RESOURCES

Fax your resume to 1-800-660-9570, toll-free, or visit our website on the Internet at <http://www.rhotech.com>.

All responses kept in strict confidence. Equal opportunity employer.

Programmer/Analyst (Houston, TX area client site) Design, develop, code, implement and debug programs using C and ADA in a variety of hardware environments. Bachelor's degree in Comp. Sci., Math, Engineering, or Business Admin. and 1 yr. exp. in job req. 40 hrs/wk. 9am-5pm. \$36,860/yr. Apply at the Texas Employment Commission, Houston, TX, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778. J.O. #TX505202. Ad Paid by an Equal Opportunity Employer.

SAP

We specialize in the placement of SAP professionals and have over 300 openings worldwide for long term contracts and permanent positions. We have low overhead, so we can pay you TOP rates!

People Unlimited

1805 Sardis Rd. N. #103 Charlotte, NC 28270 Phone: 704-841-1135 Fax: 704-841-1173

EMC CORPORATION
WE'RE TAKING OUR IDEAS OUT
OF STORAGE AND INTO THE

OPEN.

Immediate Open Systems/ Client Server Opportunities

To get results, you have to be aggressive. You have to think outside the box and consider every angle. This is especially true when it comes to helping EMC's Fortune 500 clients define their database requirements in open systems computing environments. Our Systems Engineers do whatever it takes to support our global customer base. Which is easy given that our complete family of storage products are all capable of meeting the requirements of the most demanding client/server applications. The result: EMC is the world's leading supplier of enterprise-wide information storage and retrieval products for mainframe, midrange and open systems computing environments. Our ability to bring solutions to clients with enviable time-to-market has earned us a reputation for exceeding expectations. Now, as demand for our services continues to break records, we need even more results-driven professionals who can achieve anything they set their minds to. Join us at EMC, and you'll be impressed with the results.

Pre-Sales Systems Engineers

Atlanta, Boston, Chicago, Dallas, Detroit, Kansas City, New York, Philadelphia, San Francisco, Toronto & Other North American Locations

We are seeking seasoned, articulate Systems Engineers with excellent customer/account management skills to be responsible for new open systems products. To qualify, you should have a strong working knowledge of a major version of the UNIX operating system, preferably AIX, HP/UX or SunOS. Experience with Sybase, Oracle, and/or Informix databases a major plus. Your skills must include the ability to do pre-sales, systems/capacity planning, performance tuning and system analysis. Additional requirements include a BS degree, 5+ years' experience, supervisory or presentation skills and at least 3 years' experience on UNIX based systems.

• Sales Representatives & Customer Engineers - Openings will also be available throughout North America for individuals with experience in the Open Systems arena. These positions require working knowledge of a major version of the UNIX operating system, preferably AIX, HP/UX or SunOS, a BS and 5+ years of experience.

EMC offers outstanding benefits, challenges and rewards. For immediate consideration, please send resumes, indicating position and location of interest: to: Director, Open Systems Staffing, Dept. CW1030, EMC Corporation, 42 South Street, Hopkinton, MA 01748-9103; Fax: (508) 435-8884. Or you may e-mail your resume to: resumes_emc@us.emc.com. Attach and save your resume as an ASCII text file using up to 8 characters of your last/first name + .TXT (i.e. SMITHJOE.TXT). If you are using Word for Windows 6.0, save the document as MS-DOS Text with line breaks. An Equal Opportunity Employer.

EMC
THE STORAGE ARCHITECTS

THINKING OUTSIDE THE BOX

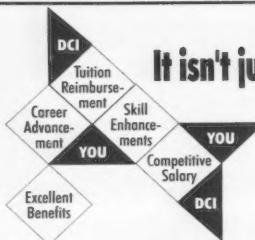
INTELLIGROUP, INC.

We are continually looking for top notch SAP R/3 professionals in the following areas of expertise to staff our new projects and requirements:

- Project Leaders
- Functional Module Specialists
- ABAP/4 Programmers
- BASIS Consultants

Mail or Fax your resume to:
Intelligroup, Inc., SAP Staffing
5 Lincoln Highway, Suite 4
Edison, NJ 08820
(908) 603-8909 phone
(908) 603-8819 fax

Computer Careers



**It isn't just the elements-
It's how they
come together!**

Over the past 12 years, Decision Consultants, Inc., has grown into one of the nation's largest and best known consulting companies. Our business partners include: Microsoft, PowerSoft, ASNA, and SAP as Preferred Providers in the airlines, automotive, telecommunications, and computer industries. We serve many Fortune 100 companies.

Developing long-term, enterprise-wide solutions is a cornerstone of Decision Consultants, Inc.'s business objective. Our consultants provide expertise in virtually every language, tool set and operating system to define and implement systems solutions in the PC, Client/Server, workstation, mid-range, mainframe, and supercomputer environments.

Our training initiatives range from the Professional Development Program, a career opportunity for professional-level professionals, to full-service coursework in the latest technologies. Classes are presented in our state-of-the-art Training Centers across the country.

The compensation and benefits we provide are among the best in the industry. We offer a full range of career path opportunities to encourage personal and professional growth.

If you are ready to accept the challenge of a great opportunity, send your resume to the office in the geographic location you prefer.

Business Systems Branch (SAP)
(800)329-3526 • FAX(1)(3)572-6088 • jmk4281@sol.com
Chicago Branch (800)414-4324 • FAX(708)240-0234
muller@dc-chicago.com@compuserve.com
Dallas & Raleigh NC Branches
(800)304-4324 • FAX(214)386-0741
oathimore@dc-dallas.com@compuserve.com
Detroit Branch
(800)324-4001 • FAX(1)(3)552-3010 • dc@dc.com
Fl. Lauderdale Branch
(800)324-4001 • FAX(305)389-8204 • dcfl@gate.net
Jamesville-BR Branches (800)246-4085
FAX(704)464-8299 • ppk@jdc@jdc.com
Orlando Branch
(800)399-9932 • FAX(1)(3)572-6088 • jmk4281@sol.com
Tampa Bay (800)329-3526 • FAX(1)(3)572-6088 • dc@dc.com
Telecom Branch (800)977-8170 • FAX(1)(3)977-4674
dc@dc.com@sol.com
Also available in our newest branches at Austin (Texas), and Boulder (Colorado) • (800)324-4001 • FAX(1)(3)552-3010 • dc@dc.com

**decision
consultants
inc.**
http://www.dccorp.com
DCI is an equal opportunity employer (M/F/D/V)

CONSULTANTS

We are Oracle, Applications, and Client Server specialists, also serving our clients other IS requirements.

- * Oracle * Oracle Financials * Peoplesoft * Powerbuilder
- * Informix * Sybase * Unix * DB2/AS400 * CICS * COBOL
- * Contract and permanent positions
- * Top salaries & benefits
- * Full disclosure of contract rates
- * Technically trained recruiting staff

Maverick
COMPUTING INC.

Miami, FL 305 592 9990 fax: 305 592 9974 (East Coast)
Owosso, MI 517 723 9501 fax: 517 725 6383 (Mid West)
Portland, OR 503 248 0820 fax: 503 248 0821 (West Coast fr. 09/07)

Looking for qualified computer professionals?

**Look
no
further**

COMPUTERWORLD
McGraw-Hill's computer news and information source

More than over one half million computer professionals read *Computerworld* every week. And you can reach all of them — or just the ones in your region — with a regional or national recruitment advertisement in *Computerworld*'s Computer Careers section. For more information, call Lisa McGrath at 800-343-6474, x8201 (in MA, 508-879-0700); or call your local sales office listed below:

BOSTON

Nancy Percival

500 Old Connecticut Path, Box 9171,
Framingham, MA 01701-9171, 617-729-9622

NEW YORK

Marty Finn

Mack Center 1, 365 West Passaic St.,
Rochelle Park, NJ 07662, 201-587-0090

WASHINGTON, D.C.

Katie Kress

8304 Professional Hill Drive,
Fairfax, VA 22031, 703-573-4115

CHICAGO

Patricia Powers

1011 E Touhy, Suite 550,
Des Plaines, IL 60018, 708-827-4433

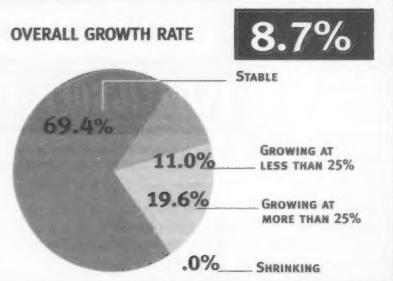
LOS ANGELES

Barbara Murphy

2171 Campus Drive, Suite 100,
Irvine, CA, 92715, 714-250-0164

CAREER SURVEY: Technical/Scientific Software

INDUSTRY HIRING TRENDS

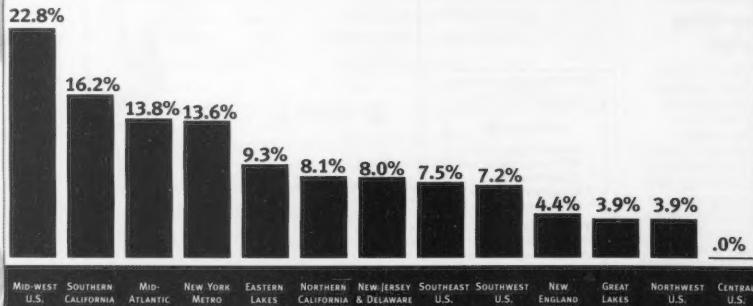


SURVEY BASE: 209 TECHNOLOGY FIRMS
INVOLVED IN TECHNICAL/SCIENTIFIC SOFTWARE

SURVEY CONDUCTED BETWEEN JULY '95 AND SEPTEMBER '95:

© Copyright 1995, Corporate Technology Information Services, Inc., Woburn, Mass.

REGIONAL GROWTH ANALYSIS



CORPTECH, A DIRECTORY PUBLISHER IN WOBURN, MASS., TRACKS THE U.S. 35,000 TECHNOLOGY MANUFACTURERS. THIS SURVEY RELATES TO THE 29,383 TRACKED FIRMS WITH FEWER THAN 1,000 EMPLOYEES.

1996 CORPORATE TECHNICAL RECRUITING CONFERENCE



June 2- 5, 1996
suburban Denver, CO
1-800-488-9204
to register or for more info

Marketplace

CONFERENCE watch

Nov. 13-17

Comdex

By Amy Malloy

Want to spend a week networking with 200,000 of your colleagues? If so, go to Comdex/Fall '95 in Las Vegas next month. "Big" is the word repeatedly used to describe the annual trade show, and big it is. With more than 1,000 product announcements and thousands more products on display, vendors will try to turn heads their way. And they will do everything imaginable to draw your attention. Vendors also will be fighting the inevitable temptation of the gambling tables for your attention. *Computerworld* asked attendees what motivated them to become part of the fanfare created by the biggest show in the industry. They offered the following comments:

MATTHEW REYNOLDS
Systems analyst
TRW, Inc.
Redondo Beach, Calif.

"I'm going for fact-finding. There are a couple of seminars that look really interesting. I'm going for informational purposes and to explore and report on new technologies for my company. I'm [looking] for anything to do with client/server, object-oriented programming and [Microsoft Corp.'s] Visual Basic programming. I'll educate the staff on the current technology and different techniques that I pick up there."

ALAN ALDWORTH
Vice president of operations and development
Tribune New Media/Education Chicago

"We operate businesses in this industry. I think it's important to go to the key trade show and walk the

floors so we can be aware of everybody in the market and their products. It's really curiosity and education. It's good to get a sense once a year of what's going on. I'm always interested to see what the total industry and marketplace consists of from year to year in terms of companies and products. It's really an overview of all the players. I'll watch the product demonstrations, but there are usually lines around the products that are available for testing. I don't have the time or the patience. If I really want to try it, I can buy it and try it."

NICK DUNCAN
President
GlobalData
Oklahoma City

"I've never been before, and I'm expecting a zoo. I'd like to see some specialized imaging shows. They are applicable to our core business. I'd also like to

see the latest in mobile technologies. I don't come from a technical background, so some of the high-end network stuff isn't in my realm. I'd like to see if there is anything new from Watermark [Software, Inc.] or FileNet [Corp.], if they end up out there. I'll be interested to hear what IBM is going to do with Lotus' Notes. It will be my first time [to Comdex], and from what people tell me, it may be my last."

DAVID VERGEYLE

President,
Chief operating officer
John Ryan Co.
Minneapolis



"We go there to see what the vendors have available. We're interested in seeing digital MPEG1 and digital MPEG2, display technology and flat-screen TVs. We're even more interested in what they're not showing but what they're talking about and what we can expect will show up in the future. It helps us understand which competitors might be coming to market and what products might be coming out in the future that might obsolete what we are doing today. Going to the speakers really gets to the issue of what new technology they're thinking about but not showing. We usually come with three or four people and divide the show up. We get together in the evenings to exchange information and decide where we should focus."

JOHN WISNIEWSKI
Manager of advanced technologies
Wm. Wrigley Jr. Co.
Chicago

"First, I go to Comdex to learn about emerging or advanced technologies. Second, I look at the show as a forum in which I can network with people in the industry with similar technology infrastructures. Third, I go to build better relationships with vendors. I do two things after Comdex: I write a synopsis of what I call the highlights of the sessions, and I

put all the information that I gather into folders. I pass it around to my professionals peers [in information systems]."

JAN EKONOMY

Director of new business development
NEBS Software and Services
Nashua, N.H.

"I can conduct the amount of business at one Comdex show that to do outside would take up to two or three weeks traveling around the country. I spend very little time actually going up and down every single aisle. I don't go to hear speakers or to hear about the big attractions. I go to conduct business and network. I think the only drawbacks are a matter of logistics. The most challenging part of the whole show is just getting where you need to be in a timely manner. After Comdex, we solidify partnerships and continue to nurture contacts until eventually it culminates into some business that makes sense for both parties."

ANDREW LICKLY

Third-party product manager
FTP Software, Inc.
North Andover, Mass.



"I'm going because it's the place where people in the industry meet, and it's the one opportunity to get everybody in one spot. You can track them down and talk to them [in person]. There is nothing like putting a face to a voice and a name. Comdex is a good place to meet with people to talk about technologies, standards and industry-based topics. I think we're going to be bludgeoned over the head with Windows 95 products, services and add-ons. I have enormous expectations because Comdex keeps getting bigger. Every year, I try to prepare myself for how big the show is, and still it always surprises me. It is getting to the point where five days of Comdex aren't enough."

Malloy is *Computerworld*'s assistant researcher.

ADVERTISERS LISTINGS

M A R K E T P L A C E

Where IS Buyers Find Solutions

INDEX

Computer Presentation
Boxlight (800) 762-5757

pg 113

Large Systems Computers & Peripherals
Spectra Equipment (800) 745-1233

pg 114

Outsourcing/Remote Computing
Alicomp (800) 274-5556
American Software (404) 264-5770
Faneuil Systems (708) 574-3636

pg 114

pg 114

pg 115

Network Management
Cybex (205) 430-4000

pg 114

CLASSIFIED SOLUTIONS DIRECTORY

Systems & Services
Dempsey Business Systems (800) 888-2000

pg 114

Time & Services
IBM (800) IBM-4YOU

pg 113

Training for Corporate End-Users
Keystone Learning Systems (800) 748-4838

pg 113

Used Equipment & Deinstallation
Electronic Resource Recovery (914) 427-2151

pg 114

TRADE SHOWS & EXHIBITIONS

Comdex Fall*
Las Vegas
November 13 - 17

DB Expo*
New York City
December 5 - 7

Client/Server World*
Chicago
December 5 - 7

* Indicates bonus distribution

When you buy from Boxlight, you'll get the exact system for your needs. We don't limit you to just a few products. You can choose from over 50 models in stock. Our

\$3999

Boxlight ColorShow™ 2000

trained people will ask you questions and guide you to the exact solution for your situation, sometimes at a lower cost than you might have thought possible. ■ And, we guarantee to ship your order in less than

\$1999

Boxlight ColorShow 1200

NEW LOWER PRICE!

WHEN WORDS ARE NOT ENOUGH.

CALL BOXLIGHT!

1-800-762-5757

Monday through Friday, 8:00 a.m. to 5:00 p.m. Pacific Time
Order by 12:00 p.m. for products arriving in 3-5 days or 4:00 p.m. for products arriving in 1-2 days or 10:00 a.m. for products arriving in 1-2 days.
Government: (800) 457-4009 • Resellers: (800) 736-6996
International: (360) 779-7901 • Rental: (800) 736-6994 • Fax: (360) 779-3299

\$2999

Boxlight ProColor 1301

Wide variety
Over 50 models in stock!
**CALL FOR
OUR LATEST
SPECIALS!**

Purchasing presentation equipment
doesn't get any more convenient.
Just pick up the phone and dial.

There's absolutely no risk in
buying from us, because if you're not
happy with your purchase, call us
within 30 days and return it for your
money back. No hassle. No risk!

■ **BOXLIGHT**
DIRECT

VISA
MasterCard
American Express
Discover
FedEx
Inc. 500

Video Training for Your Entire Enterprise



Dawn Bjork
Microsoft Certified Trainer
& MS Word Instructor



Rob Aronson
NetWare 4.1 Instructor
& Novell CM & ECIE



Alison Balter
Microsoft Certified Developer
& MS Access 2.0 Instructor

Call for
Free Demo Video
and Catalog

Word 6.0

Begin/Adv (ea) \$49.95

Special-All Thru \$129.95

Access 2.0

Begin/Adv (ea) \$49.95

Special-All Thru \$129.95

Lotus Notes 3.0

App. Dev. Lev 1 \$98.95

App. Dev. Lev 2 \$98.95

Special-Any Thru \$228.95

Special-All Seven \$498.95

Windows 3.1

Begin/Adv (ea) \$49.95

Special-All Thru \$129.95

Excel 5.0

Begin/Adv (ea) \$49.95

Special-All Thru \$129.95

Project 4.0

Level 1/II/IV/V (ea) \$79.95

Special-All Four \$289.95

Other Videos

PerfectOffice

SmartSuite

Visual Basic

Ask About
Windows 95
& Office 95

Average: 2 hours per video



Keystone
Learning Systems Corp.

Special Microsoft Office Video Combinations

Microsoft Office 4.0 Standard \$349.95

Microsoft Office 4.0 Standard + 3 Excel 5.0, 1 PowerPoint 4.0

• 14 videos with over 17 hours of training

Microsoft Office 4.0 Pro \$495.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 1 MS Mail training videos

• 13 videos with over 24 hours of training

Microsoft Office 4.0 Plus \$579.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

• 16 videos with over 29 hours of training

Microsoft Office 4.0 Standard \$349.95

• 3 Word 6.0, 3 Excel 5.0, 3 Access 2.0

• 3 PowerPoint 4.0, 3 Windows 3.1, 1 MS Mail

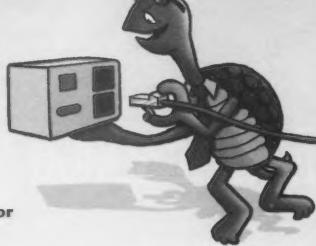
Operating your PC up to 300 Feet Away is a SNAP!

- Locate your keyboard, monitor and PS/2 mouse up to 300 feet away from your computer
- Now uses two Category 5 UTP cables for lower installation cost
- Works with PC, PC/XT, PC/AT, PS/2 and 100% compatibles
- Supports up to 1024 x 768 non-interlaced resolution
- Keep your PC in a secure, climate-controlled area and maintain access from crowded or harsh environments

SNAP PC EXTENDER

Cyber Computer Products Corporation
4912 Research Drive Huntsville, AL 35805 USA
(205) 430-4000 (205) 430-4030 fax
<http://www.cyber.com/>

Cyber and Extender are trademarks of Cyber Computer Products Corporation. PC, PC/XT, PC/AT and PS/2 are registered trademarks of International Business Machines Corporation.



Made in USA

IBM

- ES/9000
- SERIES/1
- AS/400
- RS/6000
- SYSTEM/88

...and more!

New & Used

- Computers
- Peripherals
- Upgrades

Buy • Sell • Rent • Lease

SPECTRA
(800) 745-1233

(714) 970-7000 • (714) 970-7095 Fax

Anaheim Corporate Center
5101 E. La Palma Ave., Second Floor
Anaheim, CA 92807

amdaIi
Cisco
Concurrent
Data General
digital
Hitachi
Hewlett Packard
Stratus
Sun
TANDEM
UNISYS
XEROX

Buy, Sell, Deinstall

- Purchase of used mainframe systems and peripherals
- Deinstallation Services

Wanted to Buy

- 3370 • 3420
- 3380 • 3422
- 3390 • 3480
- 4381 • 3090

914-427-2151 Fax: 914-427-7791



Electronic Resource Recovery
PO Box R • Henry Henning Dr.
Maybrook, NY 12543-0316
Contact: Bob Hewitt

Get Noticed!
Place Your
Ad in
Computerworld
Marketplace!

Networking

• Buy / Sell / Lease • Services

**Buy
Sell
Lease
Rent**

Dempsey: Your Source For IBM® Equipment

- RS/6000
- AS/400
- Industrial PC
- Data Collection
- Series/1
- 9370
- ES/9000
- All IBM PC's

- Processor
- Peripherals
- Upgrades

For pretested equipment,
flexible financing, configuration
planning, technical support and
overnight shipping call.

Offices Nationwide

Dempsey
BUSINESS SYSTEMS

16377 Beach Blvd., Suite 323 • Huntington Beach, CA 92648

(714) 847-8486 • FAX (714) 847-3149

(800) 888-2000

IBM

Authorized
Distributor Products
Integrator

IBM is a registered trademark of
International Business Machines Corporation.

ALICOMP/CBS
A Unique Outsourcing Services Provider

OUTSOURCING • REMOTE COMPUTING

TRANSITIONAL AND LONG TERM CUSTOM SOLUTIONS
VM • MVS • VSE 105,000 sq.ft. SECAUCUS, NJ COMPLEX

"OUR PLATFORM IS CUSTOMER SATISFACTION"

SERVING CLIENTS SINCE 1980

800 274-5556 • 212 886-3600

Outsourcing

Supplement your IS operation...

- Mainframe Processing
- Report Distribution to CD-ROM
- AS/400 Remote Management
- Network Management
- Applications Support
- Operations & Technical Support, and more
- Quality Account Management
- Satisfied Clients

We will help evaluate your options, formulate a flexible strategic and expeditious plan to help reach your goals - and get the fastest return on your investment.



The Outsourcing Group
A Unit of American Software USA, Inc.
470 E. Palis Ferry Road
Atlanta, GA 30305
404-264-5770

Computerworld Marketplace:

**The Buy That Will Help You
Sell More With Access to
Buyer Profiles!**

To
find out
more about
advertising in
Computerworld Marketplace
and how you can earn access to buyers
from the CW Buyers Database,
call your Computerworld
Marketplace sales
representative today!

800-343-6474, ext. 7744

**TO PLACE YOUR
ADVERTISEMENT
IN THE CLASSIFIED
SOLUTIONS SECTION
CALL
1-800-343-6474
EXT. 7744**

♦ OUTSOURCING
Save 60% on Software
Development Overseas

First Phase **FREE**
(Certain Restrictions May Apply)
SHORT TERM
We develop software **FOR**
you
LONG TERM
We will help you set up your
OWN overseas unit

**DataSoft
CONSULTING, INC**
1-800-746-1058

♦ REAL ESTATE
FOR LEASE
DATA/COMM CENTER
DALLAS, TEXAS

Available Immediately! Multi-
Use Computer Environment.
Lease all or part of 86,277 sq.
ft., 30,000 sq. ft. AC raised floor-
ing, 2 tape libraries, accessible
to Informart, D/FW and Love Field
airports. Dual power surge/outage
system; multi-vendor comm.
lines; UPS; LAN.

See you on the
Silicon Prairie of Texas!
Call for brochure or video:
Gordon Crabtree & Assoc., Inc.
214-578-8805

♦ OUTSOURCING
High Quality Offshore Solutions

A wide range of off-shore
IBM Client Servers
A wide range of project sizes
From small one-off's to setting up a
large dedicated facility to do
ongoing work.
For end users, system integrators,
software houses and contract
programming companies
-large or small.

We have 100 consultants in the U.S.
200 in India
and Four National Awards for
Software Export Excellence

Experience in offshore solutions
**DATA SOFTWARE
RESEARCH CO LTD**
Tel: (408) 496-2900 Fax: (408) 496-2911

♦ NETWORKING MANAGEMENT TOOLS

IBM **olicom** **DCA**
proteon **MADGE**

BUY • SELL • TRADE

3Com Token Link III 16/4	129.00
IBM 16/4 TOKEN RING	125.00
IBM 16/4 TOKEN RING MCA	69.00
IBM 4 MB TOKEN RING	49.00
IBM 822 MAU	149.00
MADGE 16/4 SMART RINGNODE	199.00
DCA IRMTRAC 16/4	89.00
PROTEON 1390	89.00
PROTEON 7202 WIRE CENTER	199.00
IBM 3278/79 EMULATION	129.00
IBM 5250 EMULATION	199.00
IDEACOM 5250 EMULATION	149.00
DCA IRMA I	49.00
DCA IRMA III	199.00
ATTACHMATE 3270 NEW!!!	99.00

Piedmont Data Systems
800-903-2922
Phone (770) 682-9836 Fax (770) 995-8497

**Increase
Sales,
Save
Advertising
\$\$\$\$**

Are you in the COMPUTERWORLD Classified Solutions Section Yet?

If not, you're really missing out! Computerworld's Classified Solutions section is your most cost-efficient means for placing your ad in the leading IS newsweekly - reaching a powerful audience who personally spend an average of \$4 million each per year* on IT products and services. Here is what this special section within the Computerworld Marketplace has to offer:

- Ad sizes available from 1/20th page to a full page - 15 sizes to choose from.
- Black and white or color ads, use graphics or your logo.
- New advertisers call to find out what this section within the Computerworld Marketplace has to offer you.

GET THE MOST FOR YOUR \$\$\$.

**CALL TODAY TO PLACE YOUR AD IN COMPUTERWORLD'S CLASSIFIED SOLUTIONS SECTION
800-343-6474, EXT. 7744**

*COMPUTERWORLD READER PROFILE, JULY 1994



Computerworld's Helpful Hints on Selling Your Products and Services to IS

1

Target the most qualified audience of IS professionals.

2

Place your message where informative editorial attracts these professionals to your ad

3

Work with a publication that will be your business partner offering access to buyer profiles, market research, ad design tips and more!

4

MOST IMPORTANT:

Advertise in Computerworld Marketplace every week and accomplish all of the above. It's the buy that will help you sell more!

For more information on how you can reap the benefits of advertising in Computerworld Marketplace, call today, 800-343-6474, ext. 7744.

COMPUTERWORLD

Marketplace

Computerworld, Inc.

CEO/President Gary J. Beach **Executive Vice President** Steven P. Walt **Senior Vice President/Finance** Matthew C. Smith **Vice President/Human Resources** Susan C. Perry **Executive Assistant to the CEO/President** Karen E. Elliott

Computerworld

An IDG Company: The World's Leader in Information Services on Information Technology

Publisher

Kevin McPherson

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171, Framingham, MA 01701-9171
Phone: 508-879-0700, FAX: 508-875-4394

Vice-President Editorial
Bill Labers

Vice-President Sales/Associate Publisher
David Peterson

Vice-President Marketing
Bob Winter

Vice-President Consumer Marketing
Gail Odeneal

PUBLISHER'S OFFICE: Assistant to the Publisher/Lois Beninati **MARKETING:** Director, Marketing Communications/Mary Doyle, Senior Manager, Marketing Communications/Elizabeth Phillips, Manager, Trade Show & Communications/Audrey Abbott, Sr. Marketing Specialist/Susan Thaxter, Marketing Specialist/Emily Dinnissen, Administrative Assistant/Patty White **CIRCULATION:** Director of Circulation Management/Marleen Burke **PRODUCTION:** Production Director/Christopher P. Cucco, Production Manager/Beverly Wolf **SALES CLASSIFIED:** Classified Operations Director/Cynthia Delany **DISTRIBUTION:** Distribution Manager/Bob Wescott, Traffic Manager/Pat Walker **INFORMATION SYSTEMS:** Vice-President of IS/Walter Crosby

Sales Offices

Associate Publisher/Vice-President/Sales

David Peterson

Computerworld Headquarters: 500 Old Connecticut Path, P.O. Box 9171 Framingham, MA 01701-9171
Phone: 508-879-0700, FAX: 508-879-0446

Northeast

Regional Vice President: Sherry Driscoll, Senior District Managers: Billi Cadigan, John Watt, Sales Office Coordinator: Terri Goss, Business Sales Assistant: Cheryl Stratton, Barbara Shuman, 470 Toten Pond Rd., 5th Floor, Waltham, MA 02154 (508) 879-0700 FAX: (617) 896-2669 Hearing Impaired: (800) 428-8244

Mid-Atlantic

Senior District Managers: Fred LaSapio, Vicki Gonin, Mike Bachman, Sales Assistants: Susan Kusnic, Jean Dellorario, Mack Center, 1965 New Passaic St., Rochelle Park, NJ 07062 (201) 587-0000 FAX: (201) 712-1006 Hearing Impaired: (800) 308-0288

South Atlantic

Regional Vice President: Bernie Hockwinberg, Sales Assistant: Jennifer Pattianno, 3075 Crestwood Parkway, Suite 400, Duluth, GA 30136 (404) 931-8104 FAX: (404) 931-8106 Hearing Impaired: (300) 440-4974, Senior District Manager: Mike Bachman, Sales Assistant: Mary Cavaliero, 175 Strafford Ave. #1, Wayne, PA 19087, (610) 975-4581 FAX: (610) 687-8760

Midwest

Senior District Managers: Sharon R. O'Brien, Sales Assistant: Denise Richards, 980 N. Michigan Avenue, Suite 1400, Chicago, IL 60611 (312) 214-3006 FAX: (312) 214-9662

Custom Publications

Books: Vice President/Larry Craven, Director of Publishing Services/Carolyn Novak, Project Coordinator/Heidi Bradley, Managing Editor/Peter Boucher, Graphic Designer/Gail Varney, 500 Old Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 879-0446

San Francisco: West Coast Director/Blaine R. Offenbach, Sales Associate/Nikki Wilson, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-8372

Classified/Serv.Journal

Associate Publisher: James H. Hennig, 500 Old Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 879-2384

East: Don Calamari, 1856 Windsor Park Lane, Havertown, PA 19083 (610) 446-5732 FAX: (610) 446-5753

West: Sharon Hui, 500 Old Connecticut Path, Framingham, MA 01701-9171 (500) 343-6474 FAX: (508) 828-0941

Western: Account Executive/Chris Jones, Regional Manager, 500 Airport Blvd., Suite 400, Burlingame, CA 94010 (415) 548-5544 FAX: (415) 543-5023

Markets & Advertising

Computerworld Database Division: Vice President/General Manager, Customer Information Division: Richard Mikita, Vice President: John Carpenter.

East: Account Executive VAR Database, Carol Mullin, Regional Manager, Database Services, CW Buyers Database, Linda Clinton, (508) 879-0700 FAX: (508) 879-0184

West: Account Executive VAR Database, Chris Jones, Regional Manager, Database Services, CW Buyers Database, Gena Haas, (415) 347-0565 FAX: (415) 347-8312

International Data Group

Chairman of the Board: Patrick J. McGovern; **President:** Larry Conlin; **Chief Operating Officer:** Jim Casella; **Vice President Finance:** Gene Gantner

Computerworld is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 200 computer publications in 63 countries. Forty million people read one or more International Data Group publications each month.

Advertisers' Index

Adobe	56-57	Lotus Development Corp.	38, 49, 70-71
Anixter	52	http://www.lotus.com	
Antares Alliance Group	78-79	(800) 343-5414	
AST Research	59		
AT&T	66-67, 81		
Candle Corp.	82-83		
Coda	55		
	(800) 394-CODA		
Comnet '96	96		
Compaq Computer Corp.	26-27		
Computer Associates	45		
	http://www.ca.com		
	(800) 225-522		
Comptron	120		
Compuware	30-31, 90-91		
	http://www.compuware.com		
CW Circulation	20, 24		
D&B Software	76		
	solutions@dbsoftware.com		
	(800) 290-7374		
Dell	34-35, C4		
Digital Equipment Corp.	88		
EMC Corp.	33		
Epson America Inc.	42-43		
Gupta Corporation	68		
Hewlett-Packard	18-19		
IBM	44, 62-63, 74-75, 85, 98, C3		
	http://www.ibm.com		
Information Builders	92		
Intel	25		
Kingston	94-95		
Lawson Software	40		
	http://www.lawson.com		
	(800) 477-1357		

To have your Internet address listed here, please contact Paula Wright at (508) 620-7716
This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Have a Problem With Your Computerworld Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line.

Your New Address Goes Here Address shown: Home Business

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

Name _____	State _____
Company _____	Zip _____
Title _____	City _____
Address _____	State _____

Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: **1-800-669-1002** Outside U.S. call (614) 382-3322. Computerworld members can reach us at account number 73073, 1230.

Oct. 27 Stock Ticker

Gainers

Losers

Percent

	31.0	ROSS SYSTEMS	-40.4
FORE SYSTEMS INC.	23.9	RETIK	-29.0
STRATUS COMPUTER INC.	21.5	RETHMERSON	-27.9
QUANTUM CORP.	19.6	VIEWLOGIC SYSTEMS	-24.5
NETSCAPE COMM. CORP.	18.9	INTERSOVOL INC.	-23.4
RASTEROPS	16.2	CHIPS AND TECHNOLOGIES	-20.4
NET WORTH INC.	15.3	AMERICAN POWER CONVERSION	-20.4
COMPUREWARE CORP. (L)	14.6	UNISYS CORP.	-20.3

Dollar

	13.25	KOMAG INC.	-11.75
NETSCAPE COMM. CORP.	12.25	INTERSOVOL INC.	-4.88
INTUIT INC. (H)	12.13	TEXAS INSTRUMENTS	-4.88
FORE SYSTEMS INC.	5.38	NETSCAPE COMM. CORP.	-4.40
COMPUTER ASSOCIATES	5.13	SYNTECH SOFTWARE ASSOC.	-4.06
NET WORTH INC.	3.75	APPLIX INC.	-3.50
QUARTERDECK CORP.	3.63	VIEWLOGIC SYSTEMS	-3.25
PICTURETEL CORP. (H)	3.50	QUANTUM CORP.	-3.25

Internet investors get leg up

The investing public has a voracious appetite for Internet-related products, so the American Stock Exchange (AMEX) has decided to feed it. This past week the AMEX began trading options on the *Inter@ctive Week Internet Index* (IXI), which comprises 37 Internet-related companies. It is a new options index developed in conjunction with *Inter@ctive Week* magazine.

The AMEX has two other broad technology indexes: the Morgan Stanley High-Technology 35 Index (MSH) and the AMEX Computer and Technology Index (XCI).

For the Internet Index, the AMEX "looked for companies [with Internet-related technology] that were either hot right now or with technology that is expected to shape the future of the Internet," said Dan Noonan, manager of public relations at the AMEX. The Internet Index includes Internet service providers, commercial on-line service companies, Internet tool companies, providers of videoconferencing and interactive television and networking companies (see chart).

The Internet Index isn't a mutual fund that investors hope will only increase in value. It is an options index on which investors can speculate. If investors think this segment of the market will do well, they can buy contracts accordingly. If investors think this segment is overvalued and could tumble, they can buy contracts for that outcome.

Noonan said it will be interesting to see who invests in the Internet Index. Options investors are traditionally older and conservative, he said, while the Internet's image is a collection of young, hip start-up companies.

"The Internet Index is an...outgrowth of the current market passion for all things Internet," said Harley Unger, a market analyst at Jupiter Communications, Inc. in New York. "Even for those who don't play the market, it happens to be a great barometer of where our information-based economy is heading."

—Stewart Deck

Index options

A sampling of the 37 companies in the AMEX Inter@ctive Week Internet Index	
•Novell	•Optical Data Systems
•3Com	•PictureTel
•America Online	•Sierra On-Line
•Broadband Technologies	•Spyglass
•H&R Block (CompuServe)	•Sun Microsystems
•Netscape Communications	

Second-class postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication Act #038697. Computerworld (ISSN 0895-4834) is published weekly; except a single combined issue for the last week in December and the first week in January by Computerworld, Inc., 500 Old Connecticut Path, Box 917, Framingham, Mass. 01731. Copyright 1995 by Computerworld, Inc. All rights reserved. Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Back issues, if available, may be purchased through the circulation department. Photocopy rights: permission to photocopy for internal or personal use is granted by Computerworld, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$1.00 per copy of the article, plus \$0.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. Requests for special permission or multiple copying should be addressed to CCC. U.S. — \$48 a year; Canada — \$10 a year; Central & S. America — \$350 (surface) a year; Europe — \$395 a year; all other countries — \$395 a year. Subscriptions can be ordered by calling 1-800-334-2434. Postmaster: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marion, OH 43305.

EXCH 52-WEEK RANGE

Oct. 27 Wk Net Wk Pct

3 PM CHANGE CHANGE

Communications and Network Services				OFF 2.2%	MGIC	11.50	3.63	MAGIC SOFTWARE ENTERPRISES	7.50	-0.63	-7.7
COMS	53.63	19.50	3 COM CORP.	49.13	-2.63	-5.1	MARVELL	18.50	1.25	-9.6	MANAGISTICS GROUP INC.
AIT	54.25	38.50	AMERITECH CORP. (H)	54.50	-0.50	-5.6	MAPS	17.25	2.25	-16.7	18.75
APTS	15.00	6.75	APERTUS TECH.	8.38	-0.50	-5.6	MATH	7.38	2.00	-52.8	MATHSOFT
T	38.38	47.70	ASCEND COMMUNICATIONS (H)	61.75	-0.05	-0.4	MCFAR	13.50	1.00	-38.3	MCFARE ASSOCIATES
ASND	58.80	18.00	AVAILABILITY	58.80	-0.80	-1.4	MENT	21.50	10.88	-50.0	MENTOR GRAPHICS (H)
BNY	19.78	6.00	BANYAN SYSTEMS INC. (L)	7.50	-0.63	-7.7	MICRO	18.00	1.00	-49.0	MICROGRAPHICS INC.
BNET	66.13	23.13	BAY NETWORKS INC.	64.13	-0.31	-0.5	MIGU	13.88	5.00	-10.50	MICROGRAF'S INC.
BBL	64.38	48.38	BELL ATLANTIC CORP. (H)	64.38	0.25	0.4	MSFT	109.25	58.25	-43.0	MICROSOFT CORP.
BBN	39.38	12.63	BOLT, BERANEK & NEWMAN	32.00	-2.75	-7.9	NETMAN	27.25	12.00	-52.0	NETMANAGERS INC.
BRT	22.25	9.25	BROOKTROUT TECHNOLOGY	19.25	0.25	1.3	NETS	12.00	1.00	-33.3	NETSCAPE COMM. CORP.
C	79.25	37.80	CABLETRON SYSTEMS (H)	77.25	1.25	1.6	ORCL	47.00	24.75	-47.5	ORACLE CORP.
CGRM	21.25	7.00	CABLEVISION SYSTEMS	21.25	1.25	1.6	PTMC	69.00	31.25	-54.0	PARAMETRIC TECHNOLOGY
CHP	51.13	20.00	CHIPCOM CORP.	48.75	0.00	0.0	PTRC	22.75	7.25	-69.4	PARKPLACE SYSTEMS INC.
CSCO	78.50	27.00	CISCO SYSTEMS INC. (H)	75.50	-2.63	-3.4	PWR	26.00	13.50	-49.0	PWRTECH SYSTEMS INC.
CLIX	11.38	6.13	COMPRESSON LABS INC.	7.00	-0.69	-8.9	PLAT	26.00	13.50	-50.0	PLATINUM TECHNOLOGY
COMT	12.00	3.00	COMPTON NETWORK TECH.	6.50	-0.50	-0.8	PPS	26.00	13.50	-50.0	PPS COMPUTER CORP.
KCOM	14.50	7.75	CROSSWAVE	11.00	0.00	0.0	Q2K	12.33	1.94	-83.3	QUARTERDECK CORP.
DASW	4.75	2.25	DATA SWITCH CORP. (H)	4.44	0.00	0.0	RNBO	26.75	11.25	-60.0	RAINBOW TECHNOLOGIES INC.
DIGI	64.00	26.88	DATA SYSTEMS INC.	38.75	-1.31	-3.3	ROPS	10.13	2.00	-80.0	RASTEROPS
GDC	35.75	12.00	DATASTREAM COMMUNICATIONS	51.25	-2.25	-12.0	ROTH	21.75	5.50	-75.0	ROTH SYSTEMS
GTE	41.13	29.88	GTE CORP. (H)	40.13	-0.38	-0.9	SCKEY	51.00	14.25	-72.5	SOUTHERN INTERNATIONAL CORP.
ITT	128.50	7.00	ITT CORP.	119.50	-2.75	-2.2	SDC	12.50	6.25	-50.0	STATE OF THE ART
MDA	27.13	17.25	MCLEOD COMMUNICATIONS CORP.	24.00	-0.58	-1.5	SFTA	49.50	29.38	-40.8	STERLING SOFTWARE INC. (H)
MPH	1.38	0.38	MCN COMMUNICATIONS CORP.	8.80	0.00	0.0	SSW	49.50	29.38	-40.8	STERLING SOFTWARE INC.
MNPJ	22.25	7.13	MICROCOM INC.	19.88	-1.63	-8.9	SYBS	55.00	19.88	-64.0	SYBASE INC. (H)
NTRC	10.00	3.63	NETRON CORP. (L)	5.00	0.44	10.8	SYNS	33.25	15.00	-56.7	SYNCTEC CORP.
NCD	12.00	3.50	NETWORK COMPUTING DEVICES	32.00	-0.50	-1.5	SPPS	34.00	19.75	-43.8	SYNPAC SOFTWARE ASSOC.
NET	46.50	18.63	NETSCAPE COMMUNICATIONS	37.00	-0.56	-1.4	SRV	18.13	6.75	-61.7	SYSNETS CORP.
NWTH	28.88	7.25	NET WORTH INC.	28.25	-0.75	-2.6	VIEW	24.00	7.88	-66.7	VIEWLOGIC SYSTEMS
NN	43.38	25.00	NEWBRIDGE NETWORKS CORP.	28.63	-0.50	-1.7	VMRK	21.50	7.00	-70.0	VMWARE SOFTWARE INC.
NOVL	23.15	4.00	NOVELL INC. (U)	14.38	0.13	0.9	WALL	55.50	14.50	-75.0	WALL DATA INC.
NYN	48.75	35.88	NYREX CORP.	46.75	-1.50	-3.1	WANG	19.50	9.13	-50.0	WANG LABORATORIES INC.
OCTI	42.63	17.75	OCTEL COMMUNICATIONS CORP.	33.25	2.88	9.5	WAT	10.00	-0.50	-1.6	WATSON INSTRUMENTS
OSIS	43.63	9.60	OPTICAL DATA SYSTEMS INC.	27.00	-1.60	-5.5	WEITEK	8.68	1.28	-83.3	WEITEK
PCTL	64.75	20.50	PICTURETEL CORP. (H)	64.75	3.50	5.7	WTRK	22.13	13.13	-40.0	WESTERN DIGITAL CORP.
PTON	10.75	4.75	PROTEON INC.	7.38	-1.50	-16.9	XLNX	55.50	18.13	-66.7	XLINX INC. (L)
RCX	7.88	3.00	RADCOM INC.	6.13	-0.13	-2.0	ZLG	54.13	10.73	-81.3	ZLOG INC. (L)
RETX	1.25	0.25	RAZER	2.75	0.00	0.0	ZT	28.75	1.50	-93.3	ZT
SFA	24.88	11.75	SCIENTIFIC ATLANTA INC.	12.00	0.50	4.2	ZT	28.75	1.50	-93.3	ZT
SBC	55.88	19.00	SCOTTISH WESTERN BELL CORP.	54.75	0.50	1.6	ZT	28.75	1.50	-93.3	ZT
FON	28.25	8.58	SPRINT CORP.	37.88	-0.25	-0.7	ZT	28.75	1.50	-93.3	ZT
SPR	1.25	0.25	SPRINTER MICROSYSTEMS CORP.	0.75	0.00	0.0	ZT	28.75	1.50	-93.3	ZT
STRM	60.00	24.75	STRATACOM INC. (H)	58.50	-0.50	-0.8	ZT	28.75	1.50	-93.3	ZT
TBIT	8.13	3.25	TELEBIT CORP. (L)	3.50	0.13	3.7	ZT	28.75	1.50	-93.3	ZT
USRX	96.25	16.00	US ROBOTICS (H)	89.00	-0.50	-4.8	ZT	28.75	1.50	-93.3	ZT
USW	4.75	1.25	US WEST INC.	4.75	0.00	0.0	ZT	28.75	1.50	-93.3	ZT
XIRC	21.00	9.00	XEROM INC.	9.88	0.00	0.0	ZT	28.75	1.50	-93.3	ZT
XLG	68.25	13.13	XYLOGICS INC. (H)	67.25	0.25	0.4	ZT	28.75	1.50	-93.3	ZT
PKS and Workstations											
PKS and Workstations											
AALR	9.63	3.63	ADVANCED LOGIC RESEARCH	6.50	-1.50	-18.8	CREAF	18.31	5.88	-66.7	CREATIVE TECHNOLOGIES INC.
ASTA	19.25	6.00	ADAPTER COMPUTER INC.	9.25	0.00	0.0	DATAC	20.00	1.00	-95.0	DATACORP INC.
CPO	55.28	21.33	ADMIRE COMPUTER CORP. (H)	54.00	-0.25	-0.4	DATA	19.25	1.00	-95.0	DATA RACE INC.
DELL	95.50	36.75	DELL COMPUTER CORP. (H)	89.63	-0.13	-0.1	DATA	21.50	1.00	-95.0	DATA RACE INC.
ENCI	4.13	0.25	ENCORE COMPUTER CORP.	2.00	0.13	1.3	DATA	21.50	1.00	-95.0	DATA RACE INC.
INPH	11.63	3.00	INPHONICS INC.	9.68	-1.00	-1.1	DATA	21.50	1.00	-95.0	DATA RACE INC.
MDRC	10.25	3.00	MDRCORP INC.	10.00	0.25	0.6	DATA	21.50	1.00	-95.0	DATA RACE INC.
NETF	9.00	4.25	NETFRAME INC.	5.75	-0.50	-8.0	DATA	21.50	1.00	-95.0	DATA RACE INC.
PCYR	29.25	14.63	NETSCAPE COMMUNICATIONS	10.63	-0.50	-10.0	DATA	21.50	1.00	-95.0	DATA RACE INC.
SEOS	10.00	3.13	SEQUOIA SYSTEMS INC.	6.25	0.25	4.2	DATA	21.50	1.00	-95.0	DATA RACE INC.
SRA	39.88	23.00	SYTRONICS COMPUTER INC.	30.50	0.88	23.9	DATA	21.50	1.00	-95.0	DATA RACE INC.
TDM	19.75	7.75	TANDEM COMPUTERS INC.	10.88	-0.88	-3.3	PEAK	31.75	13.25	-59.3	PEAK TECHNOLOGY GROUP
TRCD	7.63	3.13	TRICORD SYSTEMS	3.88	0.00	0.0	PERIMON	20.00	1.00	-95.0	PERIMON INC.
UIS	12.63	3.88	UNISYS CORP.	5.88	-1.50	-20.3	PRINTRONIX	20.25	1.25	-95.0	PRINTRONIX INC.
DWTF	16.25	9.00	DATA TECHNOLOGIES INC.	11.25	1.00	9.8	CDAT	12.63	5.38	-59.3	CONTROL DATA SYSTEMS INC. (H)
FILE	51.00	23.00	FILENET CORP.	45.31	-0.19	-0.4	EGGS	12.45	6.67	-59.3	EGGHEAD DISCOUNT SOFTWARE
DDDD	3.75	1.38	4TH DIMENSION	3.75	-0.15	-2.7	GME	24.75	16.75	-33.3	GENERAL MOTORS E (EDS)
FLAM	3.75	1.38	FLAMEWORK TECHNOLOGY	28.13	-0.25	-0.8	INTEL	17.00	7.25	-59.3	INTEL CORPORATION
FTPS	35.50	20.25	FTPSOURCE INC.	26.00	0.75	3.0	INTEL	17.00	7.25	-59.3	INTELLIGENT ELECTRONICS
GSOF	26.00	8.75	GLOBAL SOFTWARE	11.00	0.00	0.0	MSEL	10.25	3.88	-66.7	MERISOL CORP. (L)
GPTA	13.78	7.00	GPTA (L)	7.00	-0.81	-10.4	MICRA	15.00	8.25	-46.7	MICROGRAPHIC INC. (L)
HOGN	12.25	4.00	HOGAN SYSTEMS INC.	8.50	-0.50	-38.0	MICRA	15.00	8.25	-46.7	MICROGRAPHIC INC. (L)
INPH	12.63	3.75	INPHONICS INC.	47.25	-0.25	-2.6	PMS	54.25	37.75	-33.3	POLICY MANAGEMENT SYS.
INTR	69.00	29.63	INFORMATION SOFTWARE CORP.	12.00	-0.63	-4.9	REY	37.12	23.15	-46.7	REYNOLDS AND REYNOLDS (H)
LIGT	48.25	26.13	LEGENT CORP.	47.38	0.00	0.0	SEIC	24.50	16.75	-46.7	SEICOR CORP.
Services											
AMY	28.63	11.63	AMERICAN MGMT. SYSTEMS (H)	13.75	0.00	0.0	SIM	24.50	16.75	-33.3	SIMPLY INC.



Computron Software - In A Field Of Its Own

Computron Software delivers enterprise-wide client/server financial software that's more than a field of dreams and promises. We pioneered the field that changed the role of financial software by combining high-performance accounting systems with high-impact workflow and COOL solutions. Now clients worldwide, such as Pfizer, Supervalu and HBO, are doing more than just moving accounting to a client/server platform — they are transforming business processes into business assets. Call Computron today to learn how.

c mputron

SOFT WARE

Transforming Business Processes Into Business Assets

1-800-828-7660 (<http://www.ctronsoft.com>)

Client/Server Financials • Client/Server Workflow • Client/Server COOL™

News

UltraSPARC

CONTINUED FROM PAGE 1

will be willing to jump to the new technology and stay with Sun," said David Pensak, principal consultant for advanced computing technology at DuPont Co. in Wilmington, Del.

The UltraSPARC boxes also bring Sun customers to a fish-or-cut-bait moment. They must move to Solaris 2.5 — a new version of Sun's Unix operating system that will be introduced this week — to run the UltraSPARC systems. "There's going to be strong pressure on [independent software vendors] and users to finally bite the bullet on moving to Solaris," said George Weiss, a research vice president at Gartner Group, Inc.

The product rollout will sharpen Sun's technical edge after three years of trailing the RISC chip performance of Unix rivals Hewlett-Packard Co. and Digital Equipment Corp.

Sun's last major overhaul of

its product line was in 1989.

For the UltraSPARC line, Sun reworked its entire workstation design, wrapping it around new processors and rewiring it with fast connections to handle multimedia and high-speed networks. Analysts expect Sun to cut prices for its older SuperSPARC workstations and add high-end multiprocessor desktops and UltraSPARC servers next year.

Performance boost

The machines have garnered praise from some beta sites, which reported performance boosts of two to seven times that of older Sun workstations.

"We had two to four times improvement in performance on our imaging application," said Rex Hays, a design engineer at Eastman Kodak Co.'s advanced development product group in Rochester, N.Y.

First to roll out will be powerful midrange workstations (see story at right). Solaris 2.5 for UltraSPARC will be announced at the same time, as will 64-bit

compilers that let users' 32-bit programs take advantage of the 64-bit chip's speed.

The jump from older systems running the SunOS operating system could cause some long-time users to balk, however. Many customers had waited for software vendors to port packaged applications to Solaris 2.x. Today, some 5,700 of the 10,000-plus Sun-compatible applications run on Solaris 2.x.

But many users haven't yet adapted custom applications to Solaris 2.x. "The problem is the homegrown applications that are running," said Ahmad Saadeh, a software engineering supervisor at Space Systems/Loral Corp. in Palo Alto, Calif.

Still, Sun's new hardware should reward loyal users, Pensak said. "Sun's overwhelming strength has been its software," he said. "If their hardware comes close to catching up with their software, they will be a formidable force in the industry."

Windows scales up, too. See page 45.

Reality check

CONTINUED FROM PAGE 1

"Network and systems management is secondary to getting the business done," said Tim Tokarsky, vice president of distributed systems management at Merrill Lynch & Co. in New York. "I want a selection of point products with open, documented and free application programming interfaces so we can build our own solution."

Ongoing hassles with "management-impaired" products and vendors brought back Wedge Greene, senior data services engineer at MCI Communications Corp. in Richardson, Texas, to this year's conference.

Greene said he wants "standards compliance beyond lip service," which means "good behavior so we can make everything work together without unexpected responses or unexplained data."

However, other users said they remain leery of assembling their own management arsenal because of immediate need and limited resources.

One director of network management at a transaction service organization came seeking "more than piece parts" for his operation's staff. "We hope to gain a global view of all components and functions in a mixed SNA and routed network," he said. The management platform he wants would be enterprise-wide with integrated tools.

Once a management system is in place, its operators need help making sense of all the reported data.

British Columbia Systems Corp. has a hierarchy of management servers in place. But the network control center staff must deal with more than 40,000 alarms on some days, half of them from the SNA network, according to Keith Finnie, manager of network management systems at the utility.

"Any tool to help us reduce the alarm stream and put the alarms in context will help," Finnie said.

With delivery systems in place, administrators demand tools to track the systems supporting sales, finance, service and other business functions.

George Hsieh, a consultant to the field support organization at Price Waterhouse, specifically sought help managing key client/server applications. Monitoring faults is a first step, but "I would love to monitor performance so we can meet service-level agreements with clients," he said.

Many discussions last week addressed cost factors.

At MCI, the rapid spread of networks is compelling Greene to demand consistent vendor pricing. He said he resents "taxation" per number of devices or users and prefers a way to pay for overall functionality.

The horror story making the rounds illustrated the costly mistake of focusing on a management platform instead of the

in San Jose, Calif. Uniprocessor and dual-processor models will eventually replace the SPARCstation 20 machines.

The workstations will have fast graphics subsystems that play off the UltraSPARC chip's Visual Instruction Set for onboard multimedia and video-stream processing.

Overall speed will be boosted by the UltraSPARC Port Architecture, a crossbar switch that can move data among two or more CPUs at speeds of up to 1.3G byte/sec., sources said last week.

Despite the changes, users still will be able to use their GX-series graphics accelerators and Sun-standard Sbus connectors that link system components.

—Jean S. Bozman

Fusion meets need for speed

Beta-test sites that have tried Sun's Fusion workstations say they run 32-bit applications much faster. This includes even those that aren't recompiled for the new 64-bit hardware, users said last week.

"Our application runs four times faster than what we would otherwise run on a 50-MHz SPARCstation 10," said Peter Lomdahl, a staff scientist at Los Alamos National Laboratory in New Mexico.

The laboratory also used SunPro 4.0 compilers for Solaris 2.5 "that take full advantage of the 64-bit architecture," he said.

The first crop of 64-bit workstations will use 143- and 167-MHz 64-bit UltraSPARC chips, said Andrew Feit, director of workstation research at Dataquest, Inc.

total bundle of management components.

A retail organization spent six months evaluating a network management platform, ultimately choosing a popular Unix configuration at a cost of \$80,000 for two management servers with consoles. However, distributed agent software for 3,000 managed sites costs 10 times the platform price.

Administrators also complained their inability to hold on to that most precious resource: personnel.

"Finding technology is easy. Finding money is hard. But finding training and keeping experienced people is hardest," said Randy Smith, management project manager at United Parcel Service, Inc.

NT, Unix platforms attract support from leading vendors

Comdex/Fall '95 next month.

IBM will also provide a Windows NT-based client console that can access a server running SystemView for AIX. IBM will even support Sun Microsystems, Inc. platforms next year, Haile said.

Overall, network and systems managers were looking for cheaper, simpler systems for management tools as they try to delegate control of distributed environments to more

staff and to remote sites.

The leading vendors — Hewlett-Packard Co., IBM and SunSoft, Inc. — have been protecting their Unix base and watching to see if Windows NT succeeds, said Charlie Robbins, director of communications research at Aberdeen Group, Inc. in Boston.

"Anyone not offering an NT platform next year will be in big trouble," he said.

SunSoft will ship a version of

its Solstice Enterprise Manager for HP platforms to development partners, mostly telecommunications providers, in two months.

Simplicity takes longer, however. A prototype Windows 95 and Windows NT client now in the lab will let operators access a Solaris-based management server, but probably not until 1997, said Walt O'Malley, senior manager for enterprise management products

at SunSoft.

For their part, HP officials said that once-separate Windows and Unix product groups at HP now must function as a single product team to work with developers and support users.

Under way are OpenView versions for Windows 95 in workgroups and Windows NT for more extensive networks.

Windows NT-based platforms also are available now from Digital Equipment Corp. and will be available next quarter from Cabletron Systems, Inc. — *Patrick Dryden*

IBM, for example, is porting the 32-bit SystemView for OS/2 to Windows NT, said Don Haile, general manager of IBM's networking software division.

The OS/2 version for SystemView is in beta testing now and is scheduled for release at

The Back Page

Sooner better than later on data integrity

Charles Babcock

Robert Typanski, manager of data, methodologies and architectures at Bayer Corp. in Pittsburgh, underscored a lesson in data warehousing when he noted that his IS shop enforces data integrity in a setting that doesn't automatically encourage it.

Typanski, a member of a panel recently convened in Phoenix by *Computerworld*, is a pioneer in creating data warehouses, the informational databases that are built separate from a company's operational systems. In Typanski's case, each of Bayer's business units can order and pay for its own data warehouse.

The independent business units want to get their data as quickly as possible and at minimum cost. The IS staff has no incentive to make sure the current spot view of the data is suitable for broader use or reuse with a future system.

Bayer's IS department takes a pragmatic approach to developing data warehouses. It

quickly accomplishes the task through constant interaction on a prototype with the data's users. But IS is then left to reconcile the different definitions and descriptions between projects.

Typanski says 50% of his staff's time was spent "in data modeling, requirements-gathering and getting the business definitions and descriptions to populate a data warehouse directory."

Establishing the databases took 25% of the time, and 25% was spent moving data into the warehouse from legacy databases such as IBM's IMS, Computer Associates' IDMS or transaction-based operational systems. So 50% of its time was spent discovering the data end users needed and the format in which it was most useful, and in capturing the definition of the data from the core business.

"One of the things we keep reminding our internal customers

Getting information from data is today's leading IS responsibility, and one accompanied by relentless end-user pressure.

is that if we had done [enterprisewide data definition] when we did the operational systems [both legacy and current], we would be saving all this time," Typanski says.

This is an old idea that has come around again. Without clear definitions that relate data to business functions, valuable data remains a bunch of undecipherable alphanumerics, worthless beyond its immediate use. Getting information from reams of data is today's leading IS responsibility, and one accompanied by relentless end-user pressure.

Data administration is a "highly leveraged activity," Typanski says.

When you do it up front for your transactional systems, you can invest more time and money later in extracting information from them. If you don't do it up front, you'll be forced to do it on the back end.

Data modelers

and database administrators are being coached to prevent contending projects from turning into poor data administration. "We're shouldering that responsibility to try to integrate the data for the benefit of the whole company," he says.

Moving to Microsoft's Windows NT instead of Windows 95, as was advocated here Oct. 9, remains a hot topic. Kevin Warnock, CEO of Document Automation Systems in San Francisco, adds the following comments:

"One point I would like to make about your Oct. 9 column is that there is no free support for NT. With Win 95, one gets 90

days of free support. For a company that is regularly buying Win 95, the MIS people will be able to always call for support, since at least one 90-day period is likely to be running. I run NT, and love it. But if I run into something I can't solve myself, I will have to pay \$150 per event to get it fixed. This is roughly what NT costs! In spite of all this, I still think all companies should skip Win 95 and go directly to NT."

A new breed of chip, the media processor, is about to emerge. It was designed to move sound, video, graphics, modem and phone communications quickly over a network. Theoretically, inexpensive media processors soon will move gigabits-per-second of data through broadband pipelines, making a comparable effort by an Intel PC processor look like "sipping through a straw," says John Moussouris, CEO of MicroUnity Engineering Systems, Inc., a chip producer in Sunnyvale, Calif.

Babcock is *Computerworld's* technical editor. His Internet address is charles_babcock@cw.com.

Inside Lines

Stealing Intel's thunder

Seems like vendors just can't keep their mouths shut when it comes to Intel's Pentium Pro chip. While the chip maker itself has been coy about revealing much detail about the Pentium Pro, some of its major customers have been eagerly spilling the beans for several weeks now. The dizzying game of one-upmanship reached a crescendo last week, with some vendors finally just tossing their useless nondisclosure agreements out the window and sending in news releases about their planned Pentium Pro products. Intel is going to formally announce the chip this week, like a footnote to the whole affair.

Calling all champions

IS departments looking to install imaging systems should forget about an exhaustive product comparison. The first thing you have to do is get a Champion, according to speakers and attendees at last week's Imaging Expo in New York. The Champion, usually someone in a high-level business management position, is needed to defend the costs and benefits of the imaging system against attacks from other departments in the company.

Say it ain't so, Jim

Lotus is giving Jim Manzi a send-off on the company's World Wide Web page in the Cambridge, Mass., company's classic, quirky style. The page, dubbed "Jim, you are a visionary," includes baby pictures of Manzi and a hotlinked photo collage of Manzi's tenure at Lotus. Each section of the collage is linked to a retro-

spective piece on one event. If only Jim had \$1 for every hit on the Web page now that he is out of a job. Then again, he probably does, thanks to IBM!

Rolling toward NT

Intel next week plans to roll out a version of its LANdesk desktop management tools that broadens administration beyond Novell, Inc.'s NetWare to Microsoft Corp.'s Windows NT workgroups. Managers will be able to manage Windows NT servers, distribute software and remotely control, inventory and diag-

The 5th Wave by Rich Tennant

Arthur inadvertently replaces his mouse pad with a Ouija board. For the rest of the day, he receives messages from the spectral world.



nose PCs from a Windows NT console. Interoperability with Microsoft's Systems Management Server (SMS) fills in server control missing from the SMS, a source said last week.

oops.we.give! we.give!

The Marketry, a Seattle-based marketing firm we told you about in this column last week, has decided against selling lists of electronic-mail addresses culled from Internet newsgroups. A torrent of red hot flame mail forced the company to stop selling the addresses of Internet users after less than two weeks on the market, a Marketry spokesman confirmed. "We decided we don't want to be a pioneer in this area," he said. He declined to say just how much angry E-mail the company and its Internet access provider received when word got out.

Now we know why reporters hate to give out their E-mail addresses to the general public relations populace. After receiving a string of superfluous messages from one PR woman all week (on top of phone calls and faxes to update us, by the minute, on her product's ongoing name changes), we received a message from yet another PR worker at the same California vendor. Turns out the first PR woman had inadvertently been sending documents out that contain viruses. Oops. They were "sorry for any inconvenience." If you have similar tales of woe to share, get in touch with *Computerworld* via our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at mjohnson@cw.com.



They say, "We want client/server."



You say, "What about the time and cost?"



They say, "We need client/server."



You say, "What about systems management?"



We say, "What about the S/390 server?" Ah, everybody wins.

With the System/390® Parallel Enterprise Server, you get the advantages of client/server computing, without giving up the safety and reliability your business depends on from your current system. All while keeping your existing system investment intact.

For starters, the S/390® servers run hot new UNIX® and client/server software from IBM and other companies including DB2®, PeopleSoft HRMS, Sybase Open Client/Open Server and Tuxedo. So everybody can get just what they need.

What's more, by connecting the S/390 server to your PC, UNIX and other networks, you can easily manage your entire network system from any location.

For your current mission-critical applications, there



are a variety of programming tools that'll make them more user-friendly, and that should make everyone a lot more productive. While object-oriented tools make it easier to develop new and more powerful applications to run on the S/390 server.

And because it's designed with an availability that exceeds 99.99%, the S/390 server is built to help keep your business running. And running. And running.

To see how far the S/390 Parallel Enterprise Server can take your business, give us a call at 1 800 IBM-3333* ext. CA202. Or, turn to <http://www.s390.ibm.com> on the Net. We think you'll like what we have to say.



Solutions for a small planet™

*In Canada, call 1 800 IBM-4YOU, ext. CA202. The IBM home page can be found at <http://www.ibm.com>. IBM, System/390, S/390 and DB2 are registered trademarks and System/390 Parallel Enterprise Server and Solutions for a small planet are trademarks of International Business Machines Corporation. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited. All other company, product and service names are trademarks or service marks of their respective companies. ©1995 IBM Corporation.

DELL LATITUDE**Dependable Notebooks
With Superior Battery Life****DELL LATITUDE™ LX**

100MHz INTELDX4™ PROCESSOR

- 10.4" Active Matrix Color Display
- 8MB RAM (24MB Max RAM)
- 420MB Upgradeable HDD
- 128KB External L2 Cache
- 3 Year Extended Warranty

\$2399 Product Code #600133**DELL LATITUDE LX**

100MHz INTELDX4 PROCESSOR

- 10.4" Active Matrix Color Display
- 8MB RAM (24MB Max RAM)
- 420MB Upgradeable HDD
- 128KB External L2 Cache
- External CD-ROM/Audio
- 3 Year Extended Warranty

\$2899 Product Code #600079**DELL LATITUDE LX**

100MHz INTELDX4 PROCESSOR

- 10.4" Dual Scan Color Display
- 8MB RAM (24MB Max RAM)
- 420MB Upgradeable HDD
- 128KB External L2 Cache
- 3 Year Extended Warranty

\$2149 Product Code #600072

**Our New 100MHz
Active Matrix
Latitude LX Notebook
Starting At**

\$2399

Dell's featured computer artist is Glenn Mitsui of Studio MD, Seattle.

If you value performance as highly as you value a dollar, our Latitude LX notebook is cause for excitement. You see, for a price well within reach, the LX brings you some features you may have thought were out of reach. Such as a frighteningly fast 100MHz processor — made even faster with 128KB L2 cache — and a big, crisp 10.4" active matrix display that's incredible for graphics and presentations.

Of course, you also get all the other engineering touches that our Latitude notebooks are famous for, like the dual-battery capability that turns coast-to-coast[®] computing from hype into reality.

In fact, the only thing that might fall short of your expectations is the LX's low price. But if you're willing to put up with it, give us a call.

DELL**TO ORDER, CALL****800-433-2788**<http://www.us.dell.com/>

Keycode #12071

THE BRILLIANCE OF ACTIVE MATRIX. THE SPEED OF 100MHz. THE PRICE OF WOW.



Designed for
Microsoft
Windows 95

®In Cross-Country™ tests conducted by VeriTest, Inc., a leading independent test lab, the Dell Latitude LX 4100 lasted 3 hours 39 minutes with one battery, 7 hours 36 minutes with two batteries. That's LA to New York, no problem. The VeriTest Cross-Country™ test simulates typical executive use of Microsoft Office® applications in Microsoft Windows® v3.11 during an airplane flight. Power management was enabled and 8MB of RAM was installed. VeriTest, Inc. is located in Santa Monica, CA. For a complete copy of our Guarantees or Limited Warranties, please write Dell USA L.P., 2214 W. Braker Lane, Building 3, Austin, TX 78758. Prices and specifications valid in the U.S. only and subject to change without notice. Microsoft, Windows and the Windows logo are registered trademarks of Microsoft Corporation. The Intel Inside logo is a registered trademark and IntelDX4 is a trademark of Intel Corporation. ©1995 Dell Computer Corporation. All rights reserved.

